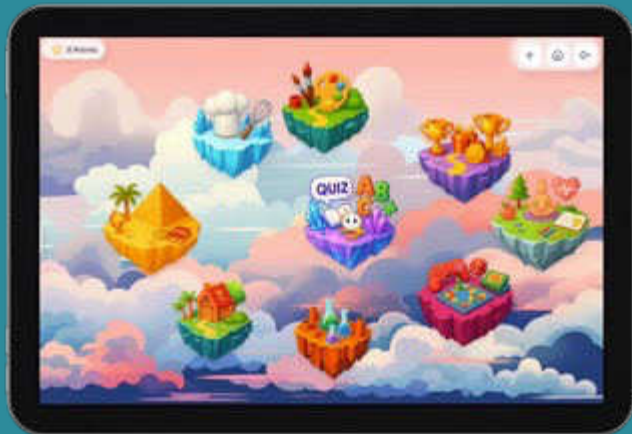




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Prisms and Pyramids - Year 6

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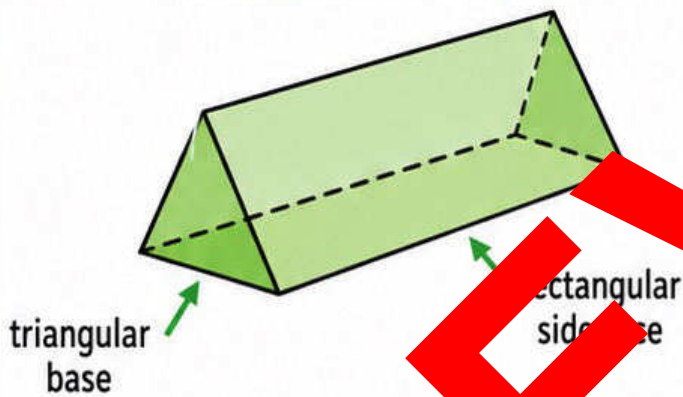


Prisms and Pyramids

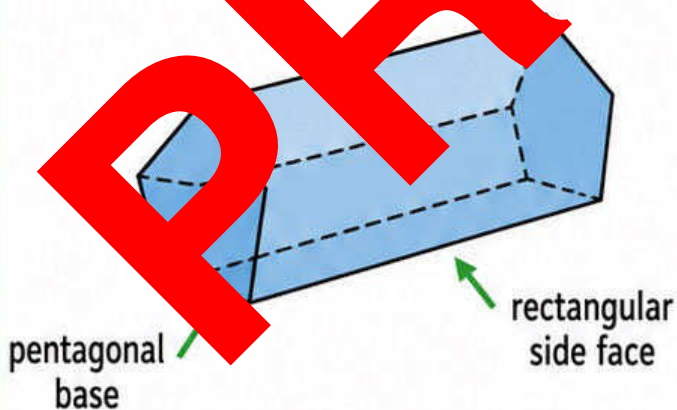
Prism

- two matching polygon bases
- rectangular side faces
- named by the base

Triangular Prism



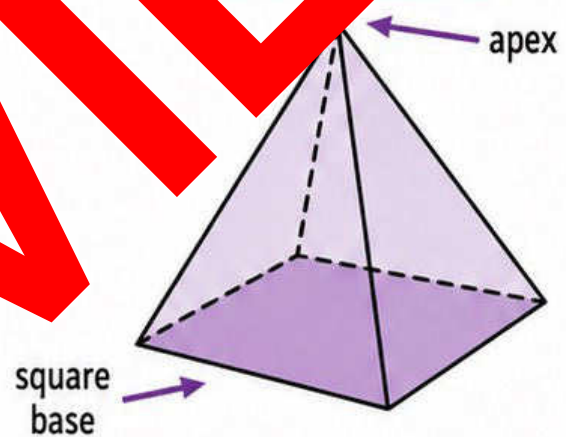
Pentagonal Prism



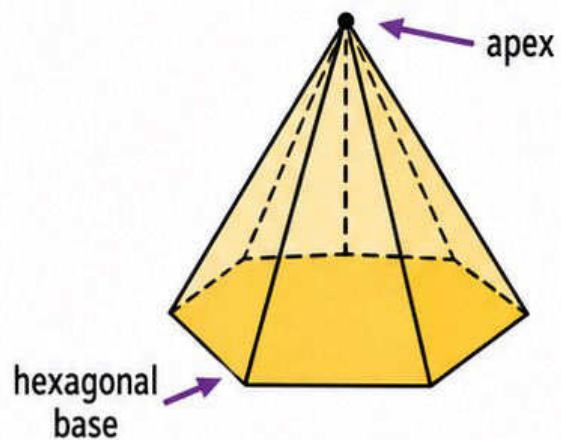
Pyramid

- one polygon base
- triangular side faces
- apex above the base

Square Pyramid



Hexagonal Pyramid



Look for **faces**, **edges**,
vertices and **nets**.

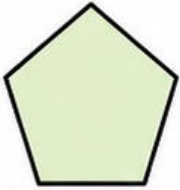


Prism or Pyramid?

Use these steps to identify and name 3D objects.

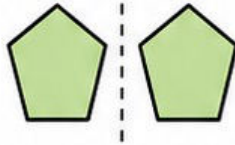
1

Find the base shape.



2

Count matching bases.



3

Check the side faces.



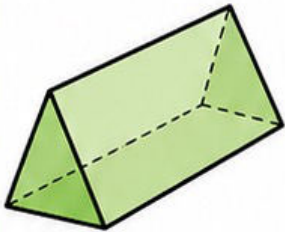
4

Name the object.



Examples

Triangular Prism

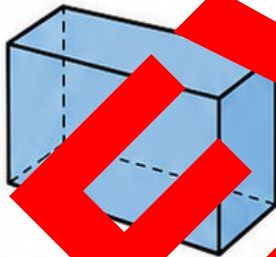


Two triangular bases.

Rectangular side faces.

Named by the base: triangular prism

Rectangular Prism

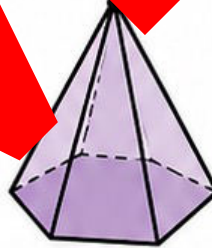


Two rectangular bases.

Rectangular side faces.

Named by the base: rectangular prism

Pentagonal Pyramid

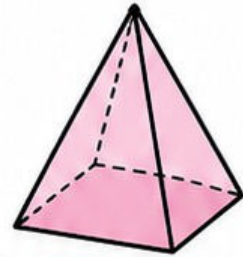


One pentagonal base.

Triangular side faces.

Named by the base: pentagonal pyramid

Square Pyramid



One square base.

Triangular side faces.

Named by the base: square pyramid

Key vocabulary

face



A flat surface on a 3D object.

edge



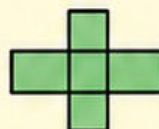
A line where two faces meet.

vertex



A corner where three or more edges meet.

net



A flat pattern that can fold to make a 3D object.

base



The bottom polygon face.

apex



The top corner of a pyramid.



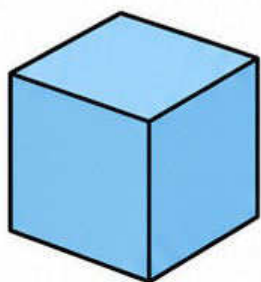
Think: What is the base shape? How many bases are the same? What do the side faces look like?



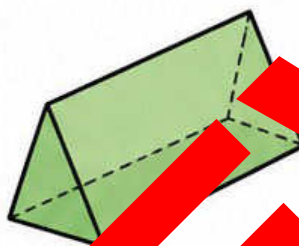
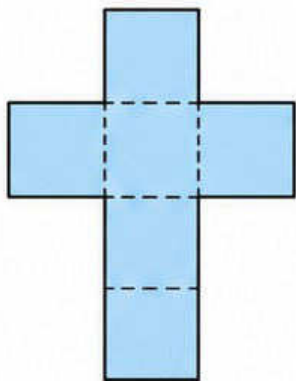
Net Match-Up Cards



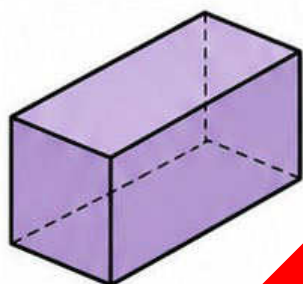
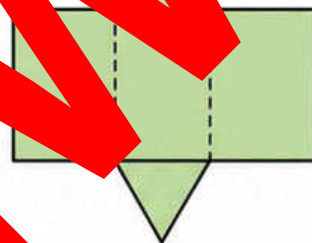
Cut out the cards. Match each object to its net.



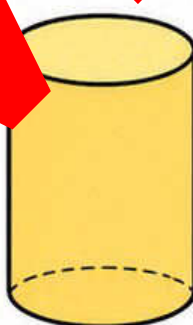
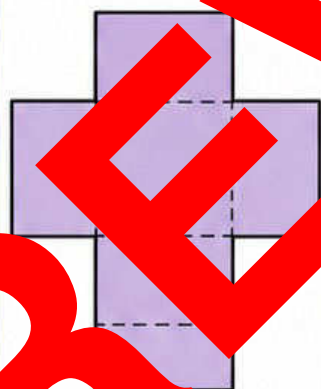
cube



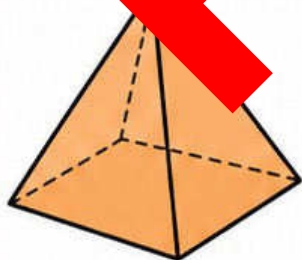
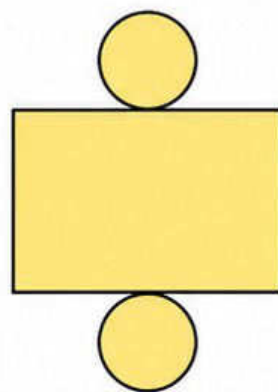
triangular prism



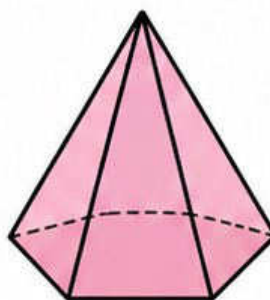
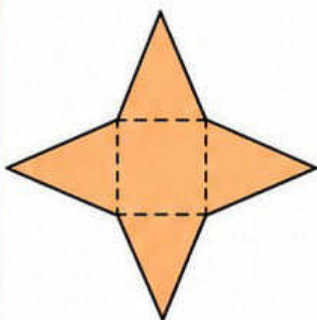
rectangular prism



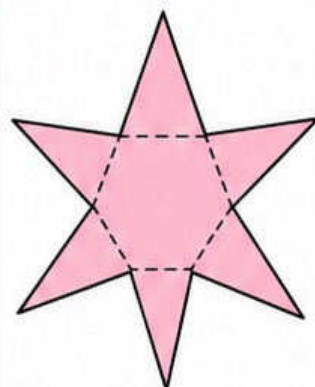
cylinder



square pyramid



pentagonal pyramid

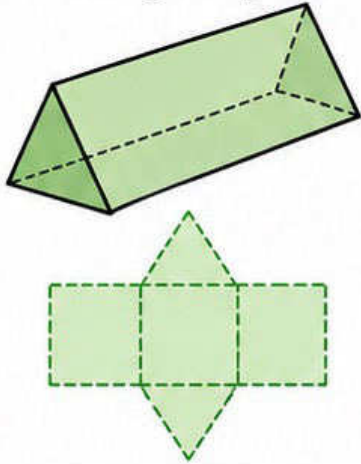


Prism Builder Challenge

Choose a challenge. Build the prism. Record its features.

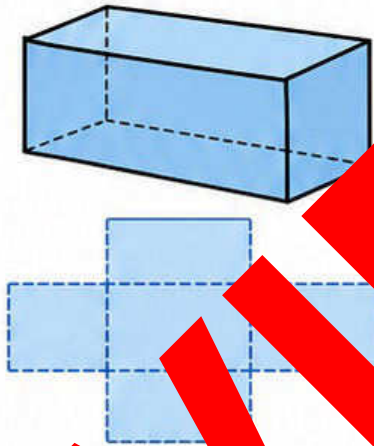
1

Build a
triangular prism

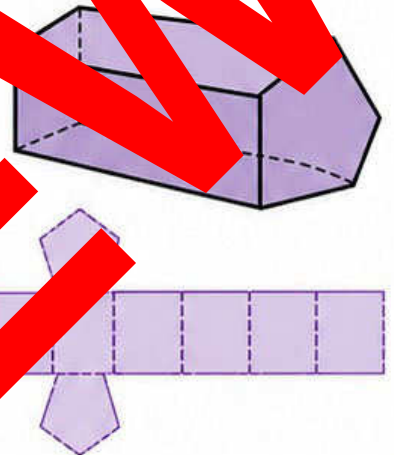


2

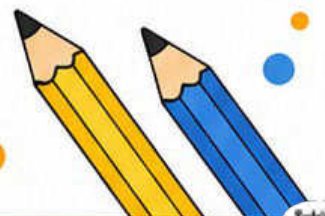
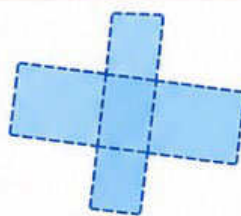
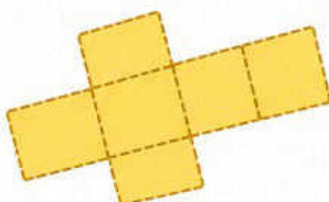
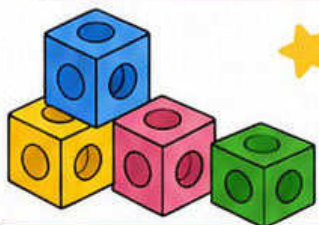
Build a
rectangular prism



Build a
pentagonal prism



Base shape	Faces	Edges	Vertices	Sketch
1				
2				
3				



Name: _____

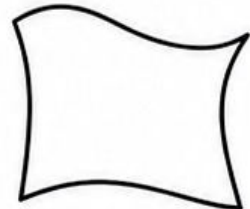
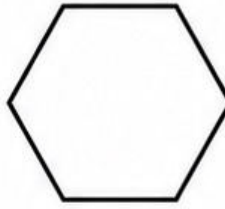
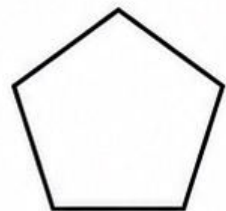
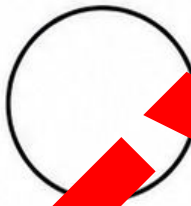
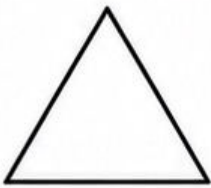
Worksheet 1: Polygon Foundations

A. Match each prefix to its number.

tri • _____
quad • _____
pent • _____
hex • _____
oct • _____
dec • _____

• 3
• 4
• 5
• 6
• 7
• 8
• 9
• 10

B. Circle the polygons. Cross out the non-polygons.



C. Complete the table.

Shape	Number of sides	Regular or irregular?
triangle		
quadrilateral		
pentagon		
hexagon		
octagon		

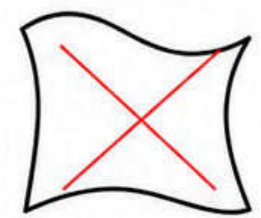
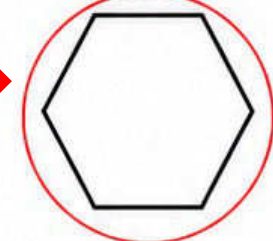
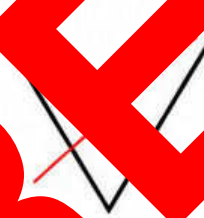
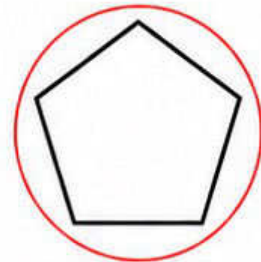
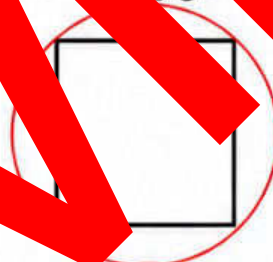
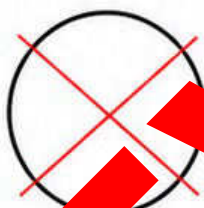
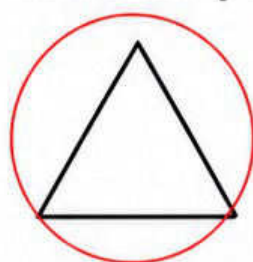
Worksheet 1: Polygon Foundations

A. Match each prefix to its number.

tri • 3
 quad • 4
 pent • 5
 hex • 6
 oct • 8
 dec • 10

• 3
 • 4
 • 5
 • 6
 • 8
 • 10

B. Circle the polygons. Cross out the non-polygons.



C. Complete the table.

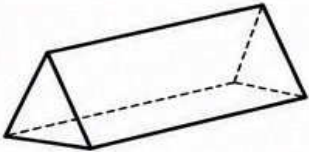
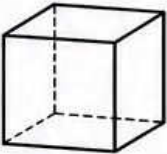
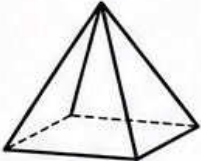
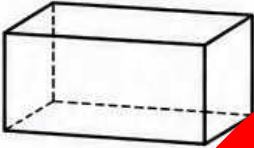
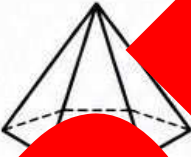
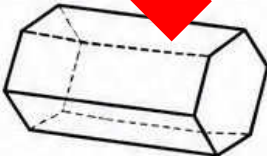
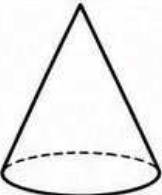
Shape	Number of sides	Regular or irregular?
triangle	3	regular
quadrilateral	4	irregular
pentagon	5	regular
hexagon	6	regular
octagon	8	regular

Name: _____

Worksheet 2: Prism or Pyramid?

Prisms have two matching polygon bases.
Pyramids have one polygon base and triangular side faces.

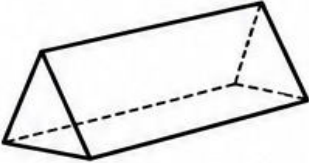
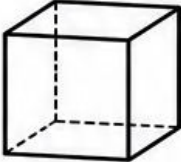
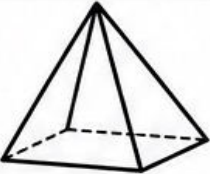
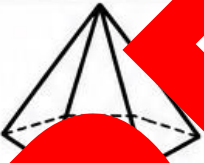
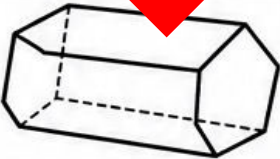
Classify each object.

Object	Prism, pyramid or neither?	Base shape	Base
			
			
			
			
			
			
			
			

Worksheet 2: Prism or Pyramid?

Prisms have two matching polygon bases.
Pyramids have one polygon base and triangular side faces.

Classify each object.

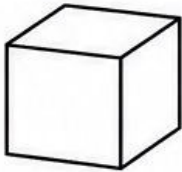
Object	Category	Base shape	Reason
	prism	triangle	two matching triangle bases
	prism	square	two matching square bases
	pyramid	square	one base and apex
	prism	rectangle	two matching rectangle bases
	pyramid	pentagon	one base and apex
	neither	circle	curved surface
	prism	hexagon	two matching hexagon bases
	neither	circle	curved surface and apex

Name: _____

Worksheet 3: Nets of 3D Objects

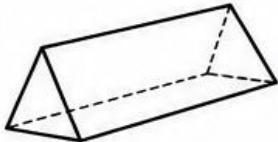
A. Match each object to its net.

1.



cube

2.



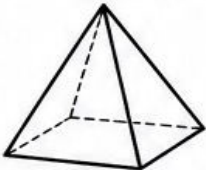
triangular prism

3.



rectangular prism

4.

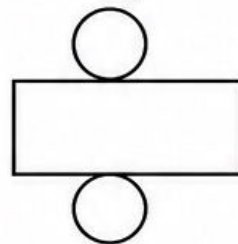
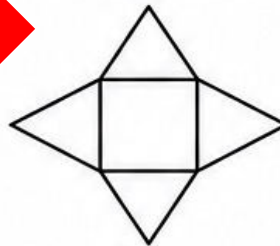
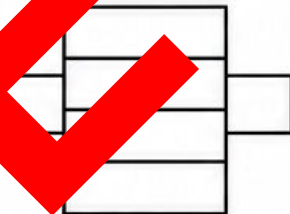
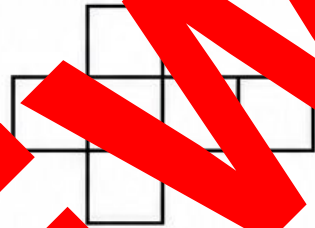
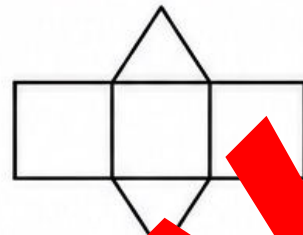


square pyramid

5.

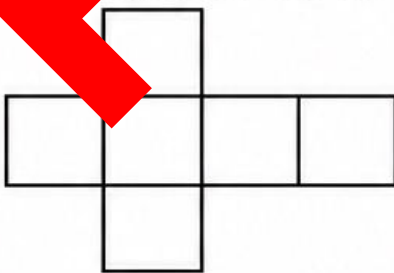


cylinder

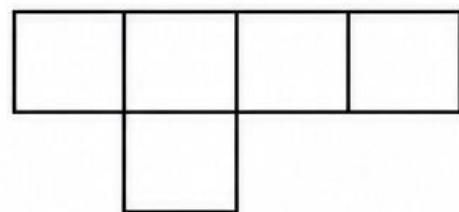


B. Will it fold? Explain your thinking.

1. Net 1: will fold / will not fold

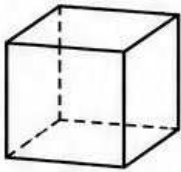


2. Net 2: will fold / will not fold

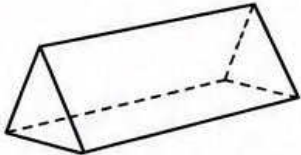


Worksheet 3: Nets of 3D Objects

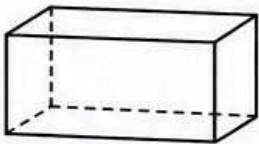
A. Match each object to its net.



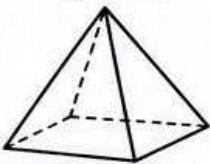
cube



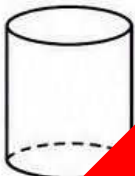
triangular prism



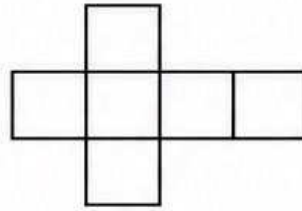
rectangular prism



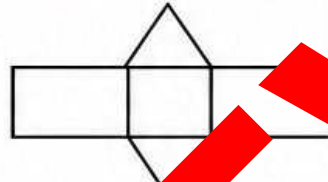
square pyramid



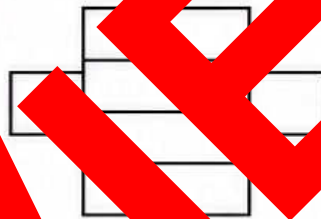
cylinder



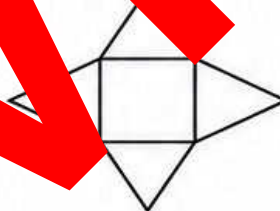
cube



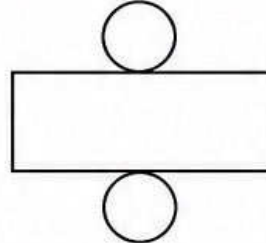
triangular prism



rectangular prism



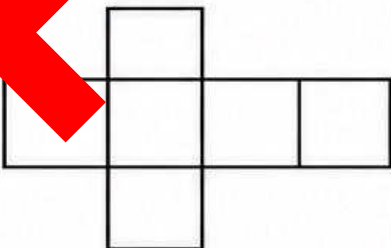
square pyramid



cylinder

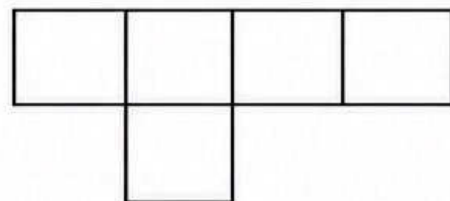
B. Will it fold? Explain your thinking.

Net 1: **will fold**



six faces connect without overlap

Net 2: **will not fold**



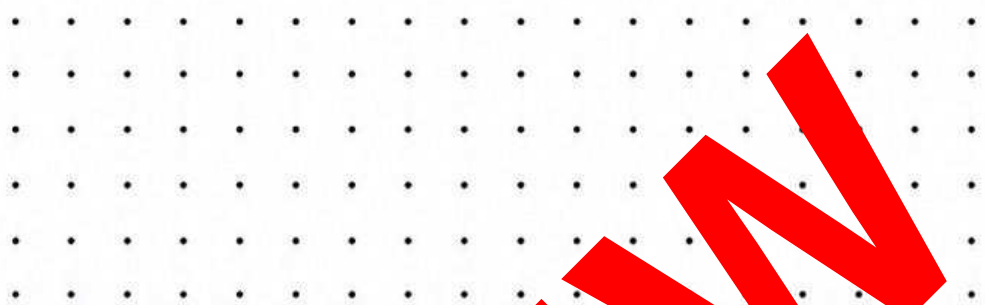
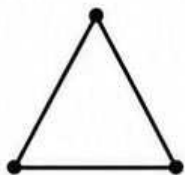
missing one square face

Name: _____

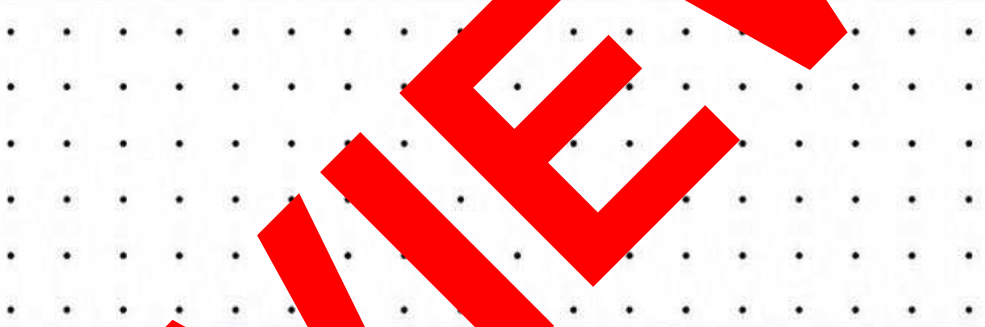
Worksheet 4: Drawing Prisms

Draw a matching face, then join corresponding vertices to complete each prism.

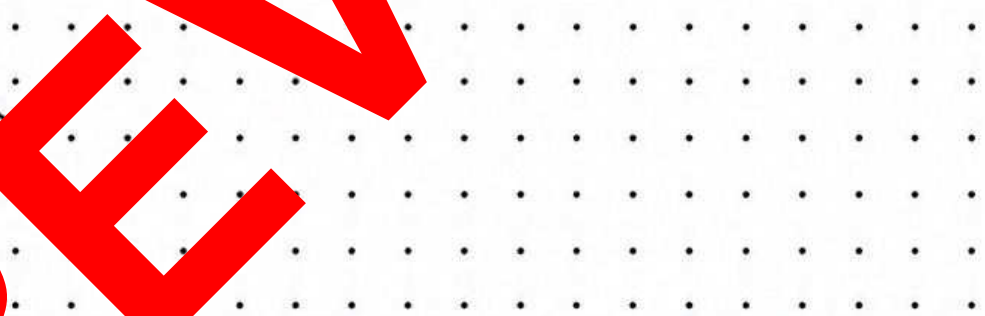
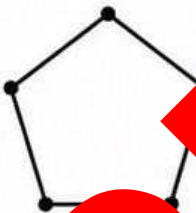
triangular
prism



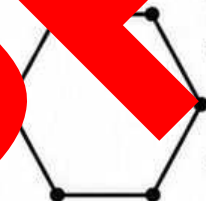
rectangular
prism



pentagonal
prism



hexagonal
prism



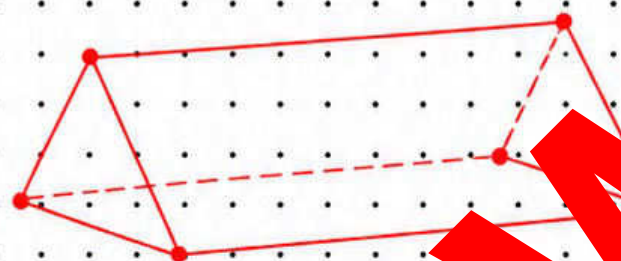
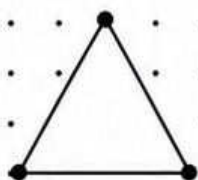
design
your own
prism



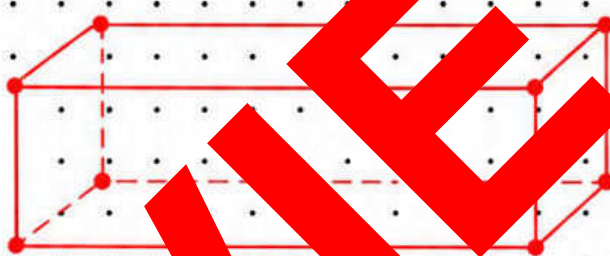
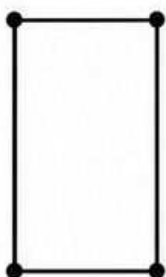
Worksheet 4: Drawing Prisms

Draw a matching face, then join corresponding vertices to complete each prism.

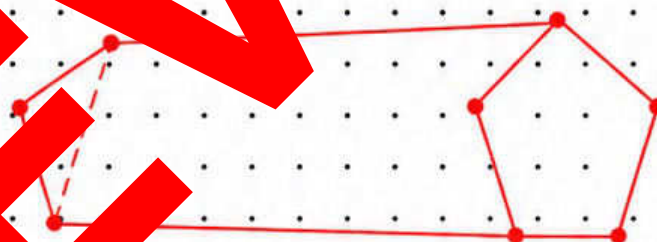
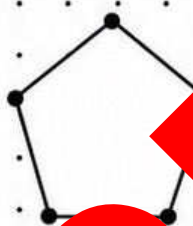
triangular
prism



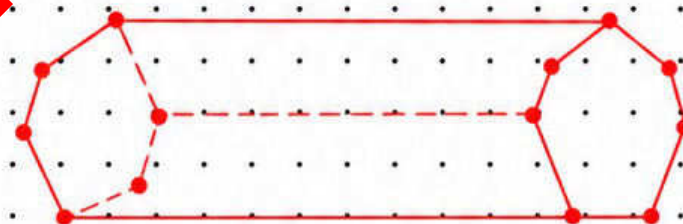
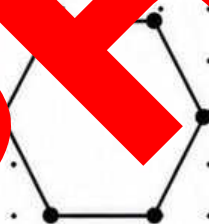
rectangular
prism



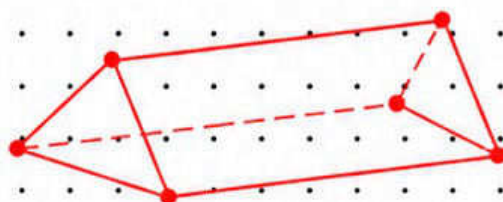
pentagonal
prism



hexagonal
prism



design
your own
prism



answers vary

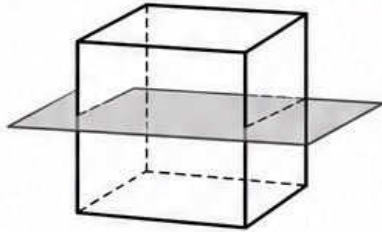
Suggested solutions shown. Final designs may vary.

Name: _____

Worksheet 5: Shape Cutter Cross-Sections

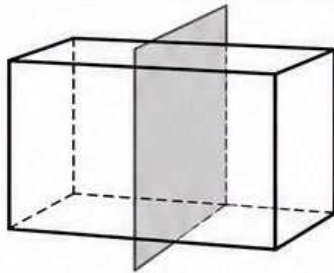
Sketch the 2D face made by the cut.

cube -
horizontal cut



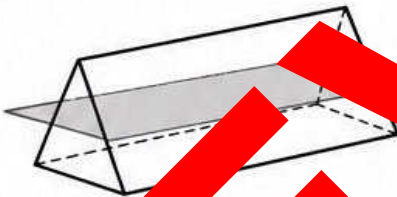
Cross-section

rectangular
prism -
vertical cut



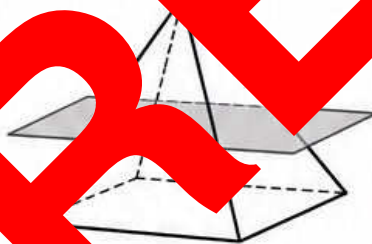
Cross-section

triangular
prism -
horizontal cut



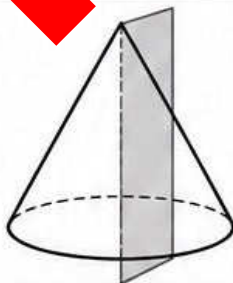
Cross-section

square
pyramid -
horizontal cut



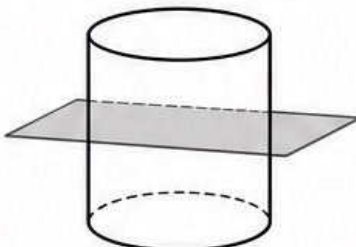
Cross-section

cone -
vertical cut



Cross-section

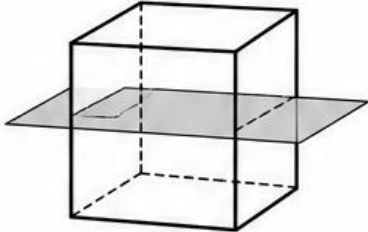
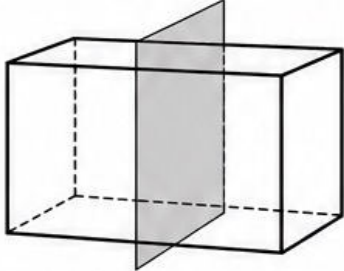
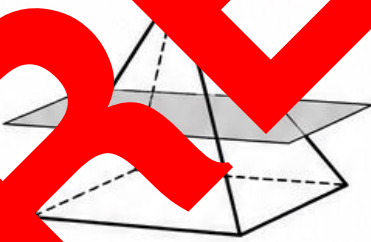
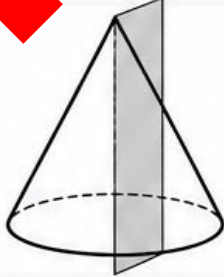
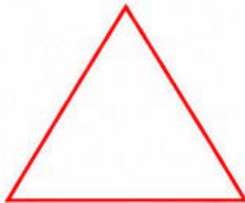
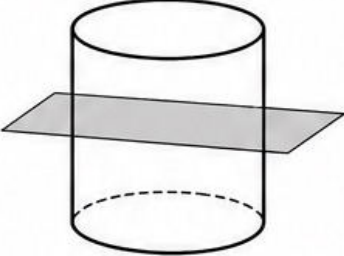
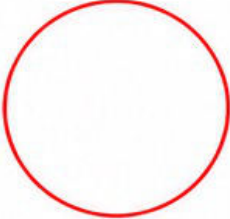
cylinder -
horizontal cut



Cross-section

Worksheet 5: Shape Cutter Cross-Sections

Sketch the 2D face made by the cut.

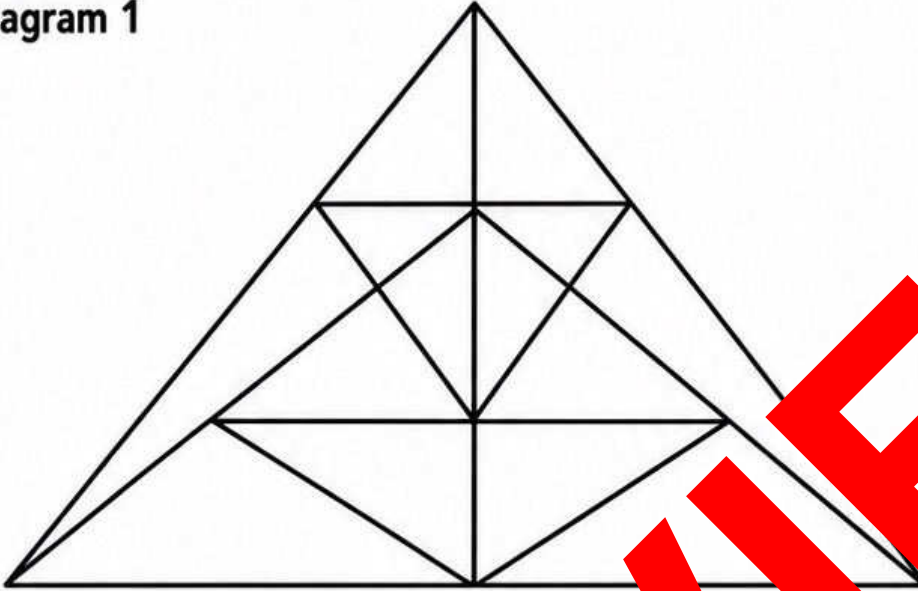
cube - horizontal cut		Cross-section square 
rectangular prism - vertical cut		Cross-section rectangle 
triangular prism - horizontal cut		Cross-section rectangle 
square pyramid - horizontal cut		Cross-section square 
cone - vertical cut		Cross-section triangle 
cylinder - horizontal cut		Cross-section circle 

Name: _____

Worksheet 6: Composite Face Hunt

Look carefully at each diagram. Count the shapes that can be made using the straight lines.

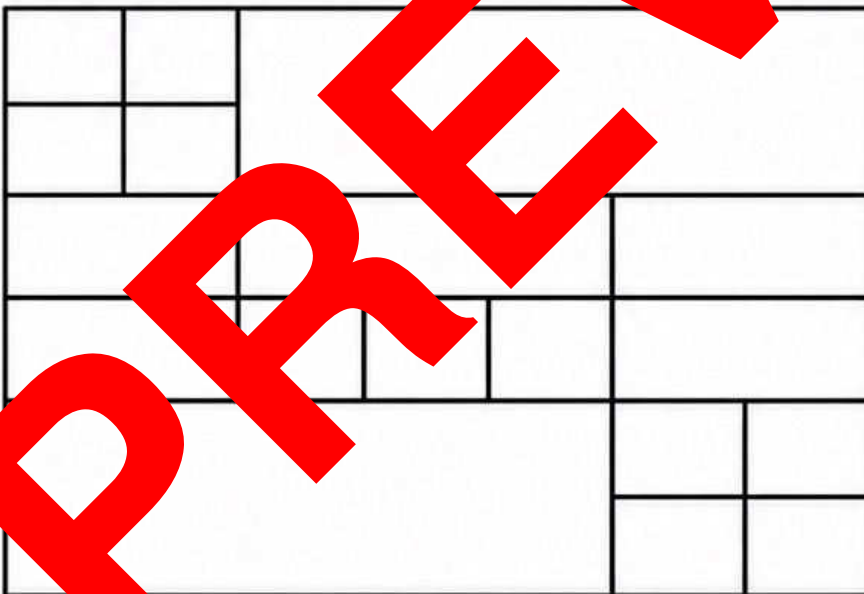
Diagram 1



Task 1:

How many triangles
can you find?

Diagram 2



Task 2:

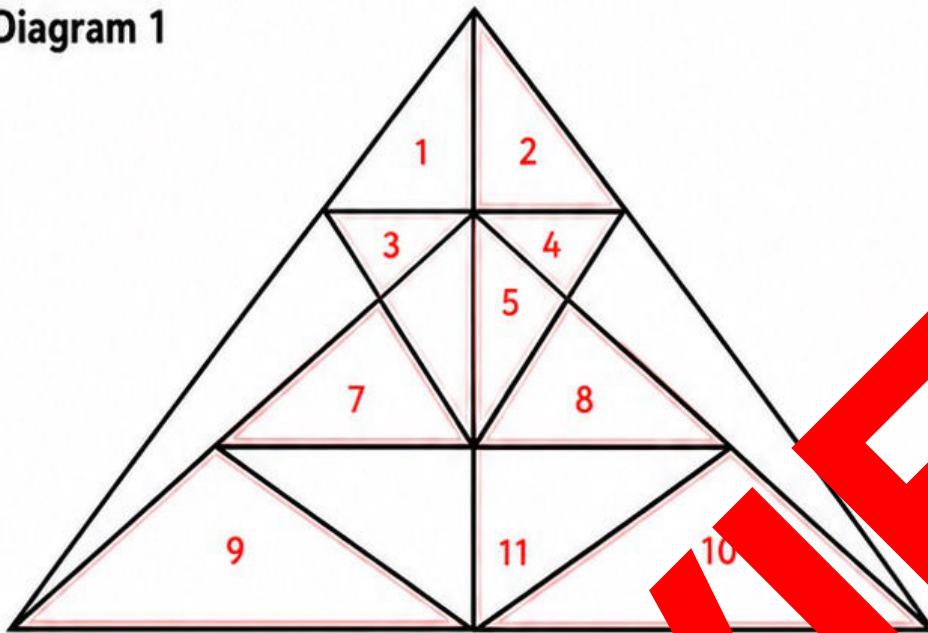
How many
quadrilaterals
can you find?

Task 3: Explain one strategy you used.

Worksheet 6: Composite Face Hunt

Look carefully at each diagram. Count the shapes that can be made using the straight lines.

Diagram 1



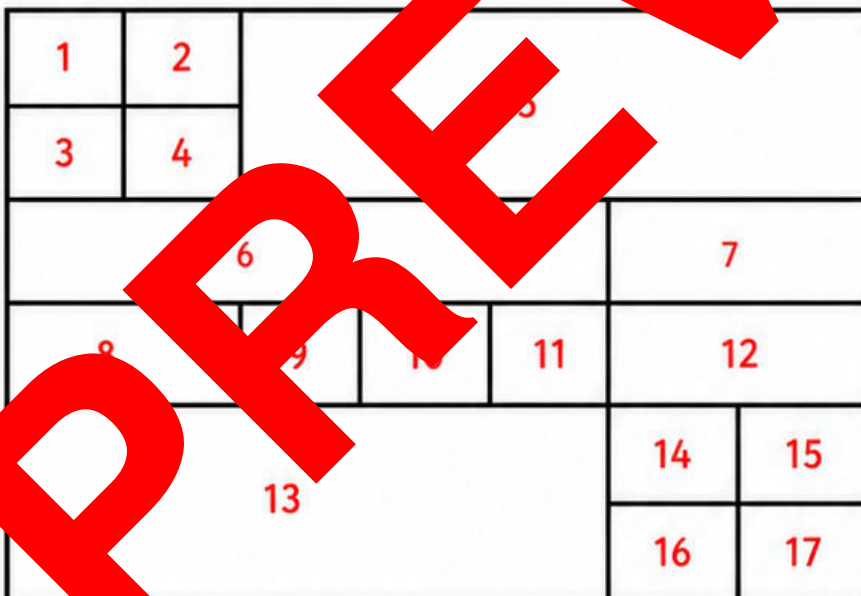
Task 1:

How many triangles
can you find?

11

Answers may vary.
Count smallest
triangles first, then
combined triangles.

Diagram 2



Task 2:

How many
quadrilaterals
can you find?

17

Answers may vary.
Count single
quadrilaterals, then
larger combined
quadrilaterals.

Task 3: Explain one strategy you used.

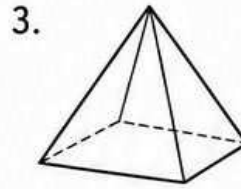
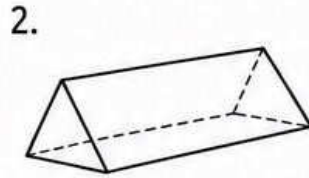
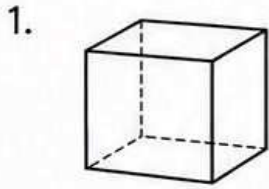
I marked each shape once, then looked for larger shapes made
by combining smaller ones.

Name: _____

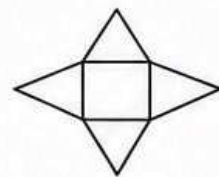
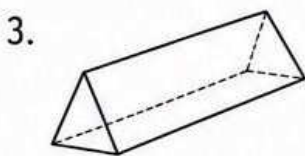
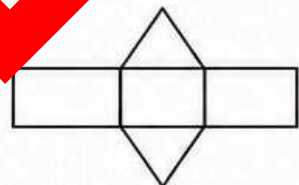
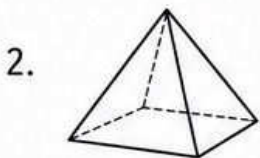
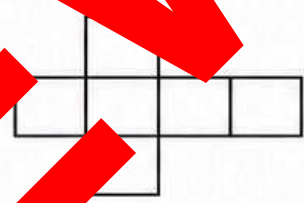
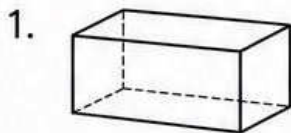
Assessment: Geometry Museum

A museum is labelling a display of 3D objects.

A. Name each object.



B. Match each object to its net.



C. Complete the table.

Object	Faces	Edges	Vertices
cube			
triangular prism			
square pyramid			

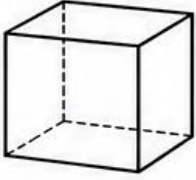
D. Explain how to decide whether an object is a prism or a pyramid.

Assessment: Geometry Museum

A museum is labelling a display of 3D objects.

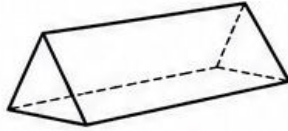
A. Name each object.

1.



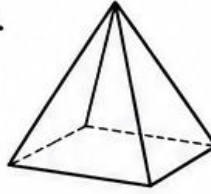
cube

2.



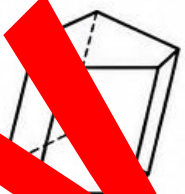
triangular prism

3.



square pyramid

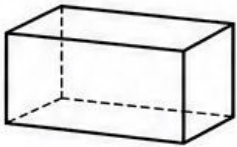
4.



rectangular prism

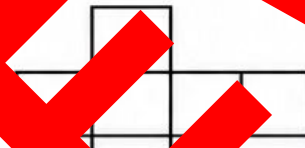
B. Match each object to its net.

1.



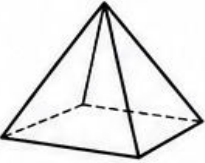
•

•



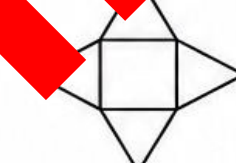
rectangular prism

2.



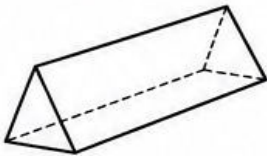
•

•



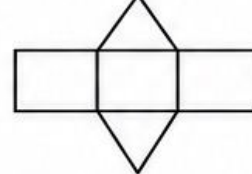
square pyramid

3.



•

•



triangular prism

C. Complete the table

Object	Faces	Edges	Vertices
cube	6	12	8
triangular prism	5	9	6
square pyramid	5	8	5

D. Explain how to decide whether an object is a prism or a pyramid.

A prism has two matching polygon bases and rectangular side faces.

A pyramid has one polygon base and triangular side faces meeting at an apex.

Prisms and Pyramids Rubric

	BEGINNING	DEVELOPING	ACHIEVING	CONFIDENT	EXCEEDING
Classifies prisms and pyramids	Struggles to identify prisms and pyramids. Often incorrect or inconsistent.	Identifies some prisms and pyramids with support. May have some errors.	Correctly identifies and classifies prisms and pyramids in familiar situations.	Accurately classifies prisms and pyramids independently in a variety of situations.	Accurately classifies prisms and pyramids in challenging situations and explains decisions.
Connects nets to objects	Finds it difficult to match nets to 3D objects. Many incorrect matches.	Matches some nets to objects. Understanding is inconsistent.	Correctly matches most nets to their objects and can explain the match.	Accurately matches all nets to their objects independently and justifies choices.	Accurately matches nets to objects, including complex nets, and explains thoroughly.
Uses geometric vocabulary	Uses few or incorrect geometric terms (e.g. face, edge, vertex, base, apex).	Uses some geometric terms with support. May use terms incorrectly.	Uses geometric vocabulary appropriately in explanations and answers.	Consistently uses accurate geometric vocabulary confidently in all work.	Uses precise geometric vocabulary to explain thinking in detail and connect concepts.
Draws and interprets diagrams	Diagrams are incomplete or inaccurate. Finds it hard to interpret.	Draws or interprets simple diagrams with support. Some inaccuracies.	Draws accurate diagrams and interprets them to solve problems.	Draws clear, accurate diagrams and interprets them confidently and independently.	Creates detailed diagrams and uses them to solve complex problems and explain reasoning.
Explains reasoning	Provides limited or unclear explanations. Reasoning is difficult to follow.	Provides basic explanations with support. Reasoning is partial.	Explains reasoning clearly using correct mathematical ideas and terms.	Explains reasoning clearly and independently with appropriate detail.	Explains reasoning in depth with flexibility and clear justification using multiple strategies.

Prisms and Pyramids

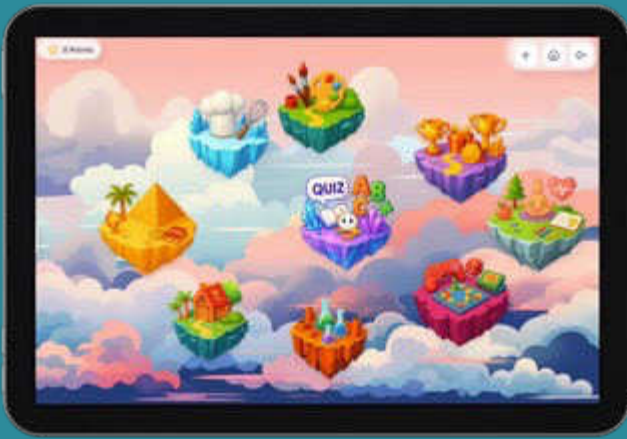


Prisms and Pyramids Quiz



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free 7-day trial

www.sukindi.com.au

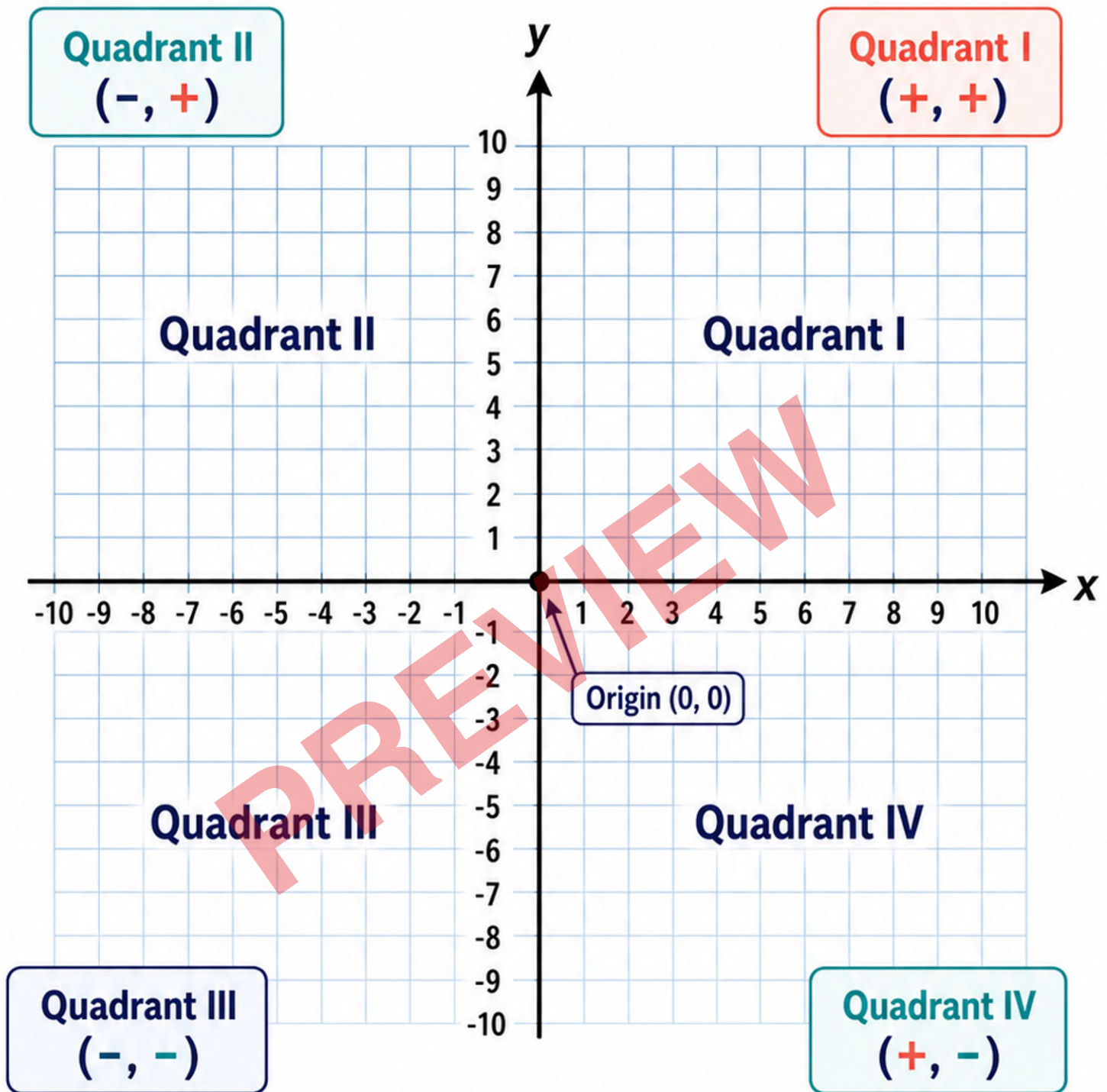


Cartesian Coordinates - Year 6

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Display: Four Quadrants at a Glance	
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Worksheet 2: Plot It - First Quadrant	
Worksheet 3: Four-Quadrant Detective	
Worksheet 4: Move the Point	
Worksheet 5: Coordinate Art - Space Rover	
Activity: Human Coordinate Plane	
Game: Coordinate Quest Board	
Game: Coordinate Quest Challenge Cards	
Quiz: Cartesian Coordinates	
Assessment: Cartesian Coordinates Check-Up	
Rubric: Cartesian Coordinates Year 6 Rubric	



Four Quadrants at a Glance



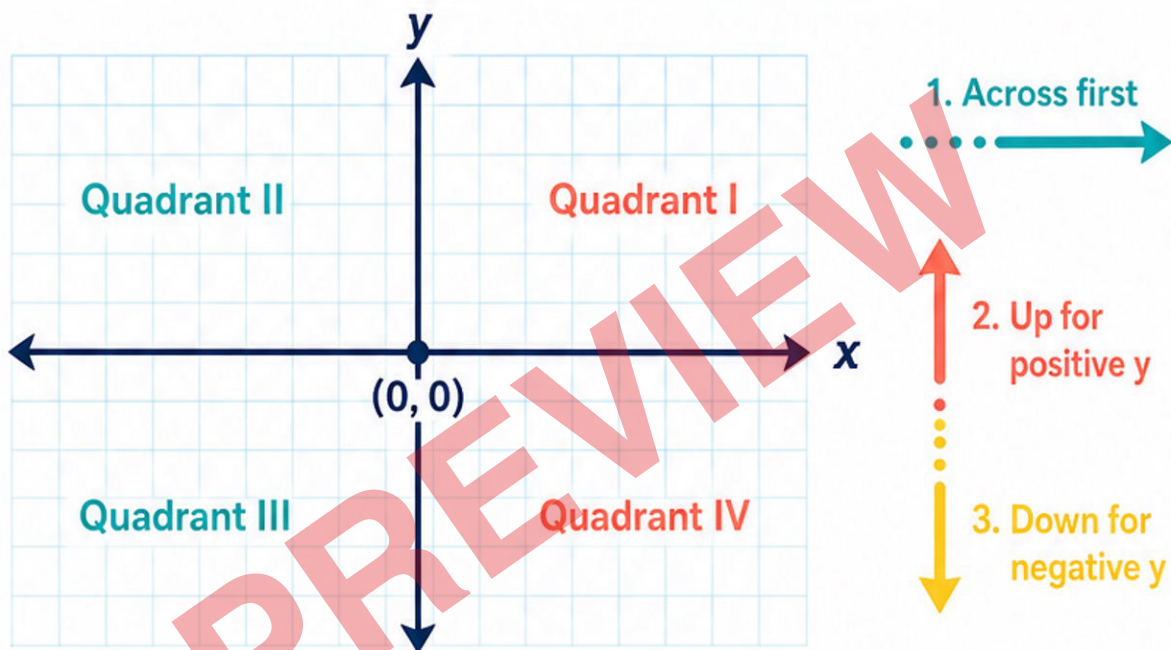
Across first, then **up** or **down**.



Coordinates are written **(x, y)**.

Human Coordinate Plane

1. Make a large x-axis and y-axis on the floor.
2. Stand at the origin, then move across first.
3. Move up for positive y or down for negative y.
4. Call out your ordered pair and quadrant.



1

Stand at
(4, 3).

2

Stand at
(-5, 2).

3

Stand at
(-3, -4).

4

Stand at
(6, -2).

5

Move from
(2, 5) to
(2, -1).

6

Move from
(-4, -3) to
(3, -3).

7

Create a
point in
Quadrant II.

8

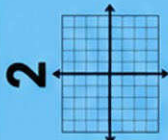
Create a
point on
the y-axis.

>>> ... Take turns as caller, mover and checker.

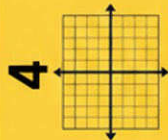
Coordinate Quest

START

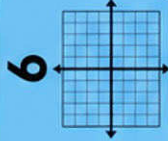
1
Name
Quadrant II



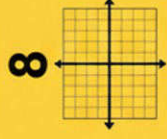
3
Plot
(4, -3)



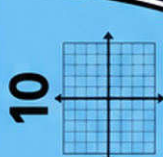
5
Read
(-5, 2)



7
Move 3 right



9
Name the
origin



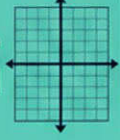
11
Plot
(-2, -6)



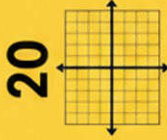
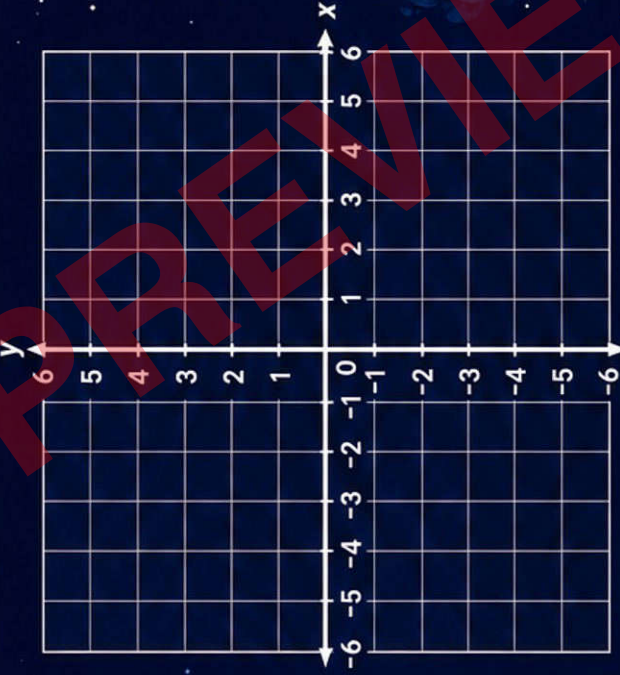
23
Point on
y-axis



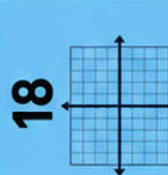
24



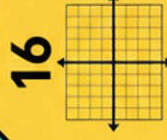
FINISH



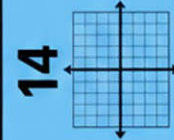
19
Swap x and y



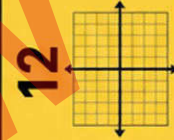
17
Name
Quadrant IV



15
Read
(6, 5)



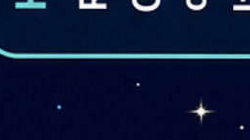
13
Move 4 up



12



8



HOW TO PLAY

Roll and move.

Complete the challenge.

If correct, stay.

If not, move back one.



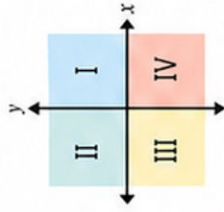
2-4 players



You need:
one die and
counters.

Coordinate Quest Challenge Cards

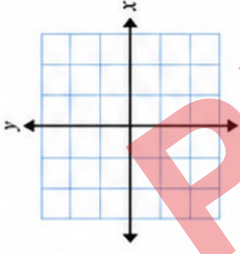
1



Which quadrant contains $(-4, 7)$?

II

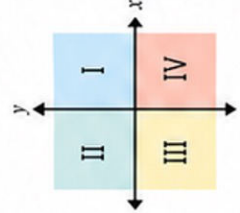
2



Plot A at $(5, -3)$.

Quadrant IV

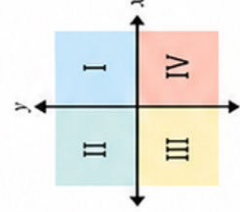
3



Move $(-2, 4)$ three units right.

$(1, 4)$

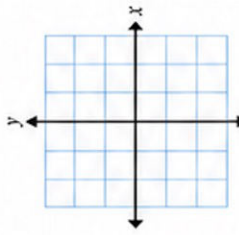
4



Move $(6, -1)$ four units up.

$(6, 9)$

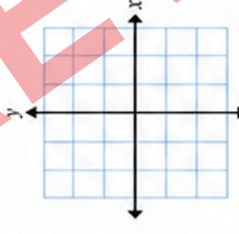
5



Which axis contains $(0, -8)$?

y-axis

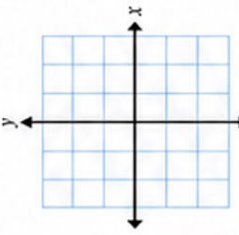
6



Which axis contains $(9, 0)$?

x-axis

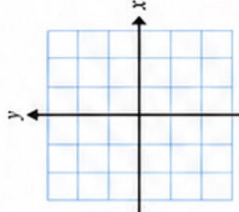
7



Name the origin.

$(0, 0)$

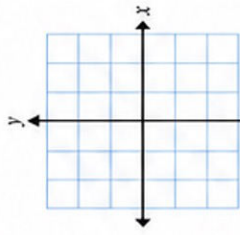
8



Reflect $(3, 5)$ across the y-axis.

$(-3, 5)$

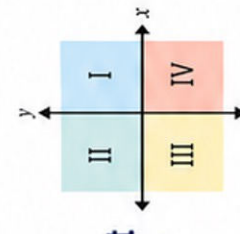
9



Reflect $(-6, -2)$ across the x-axis.

$(-6, 2)$

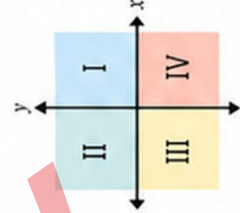
10



Which quadrant contains $(7, 6)$?

I

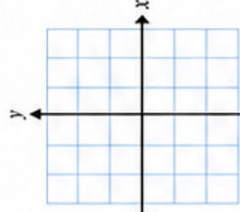
11



Write a point in Quadrant III.

Both coordinates negative

12



Swap x and y in $(-3, 8)$.

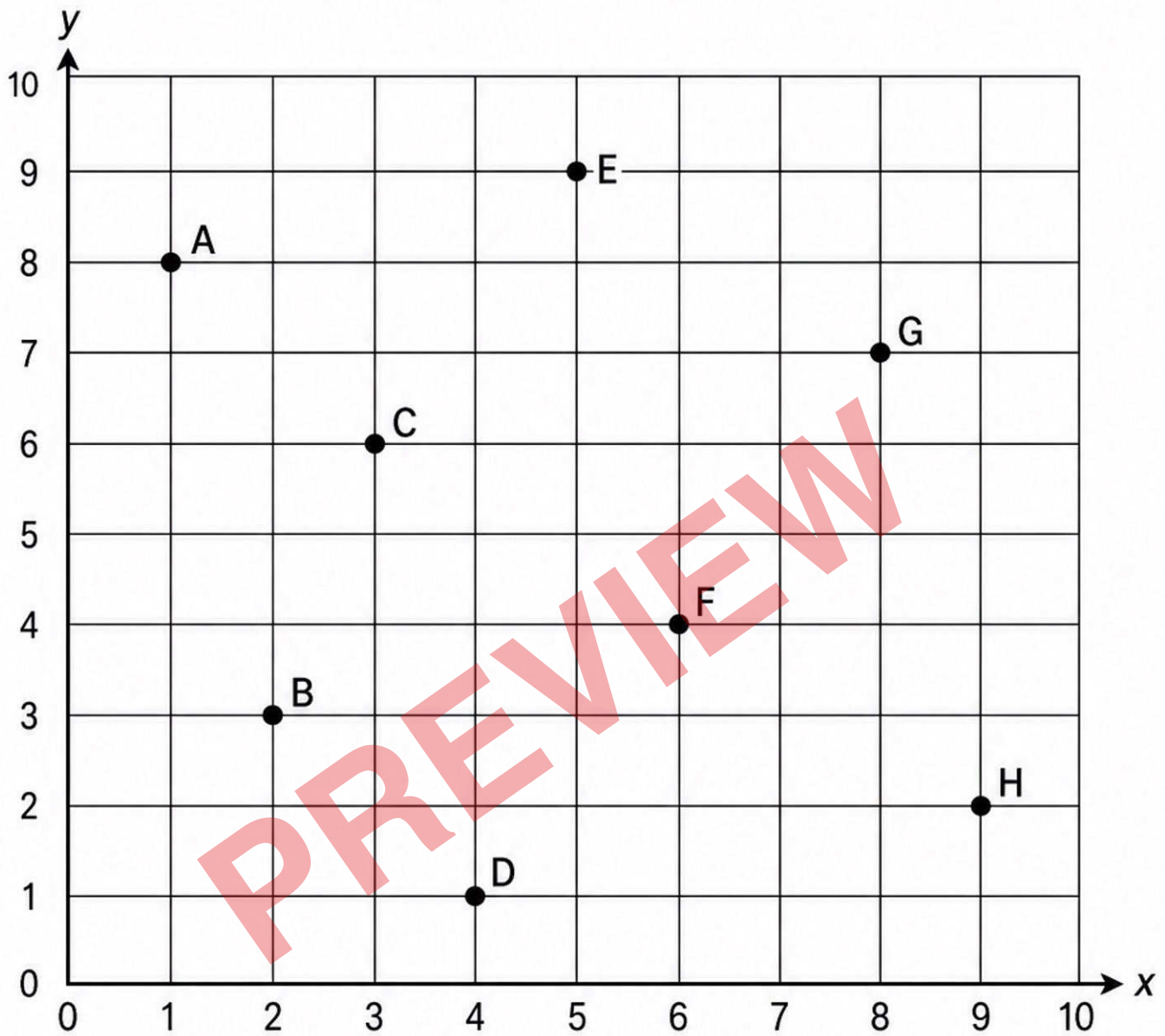
$(8, -3)$

Name: _____

Date: _____

Read the Grid – First Quadrant

Write the ordered pair for each labelled point. Remember: across first, then up.



A: _____

E: _____

B: _____

F: _____

C: _____

G: _____

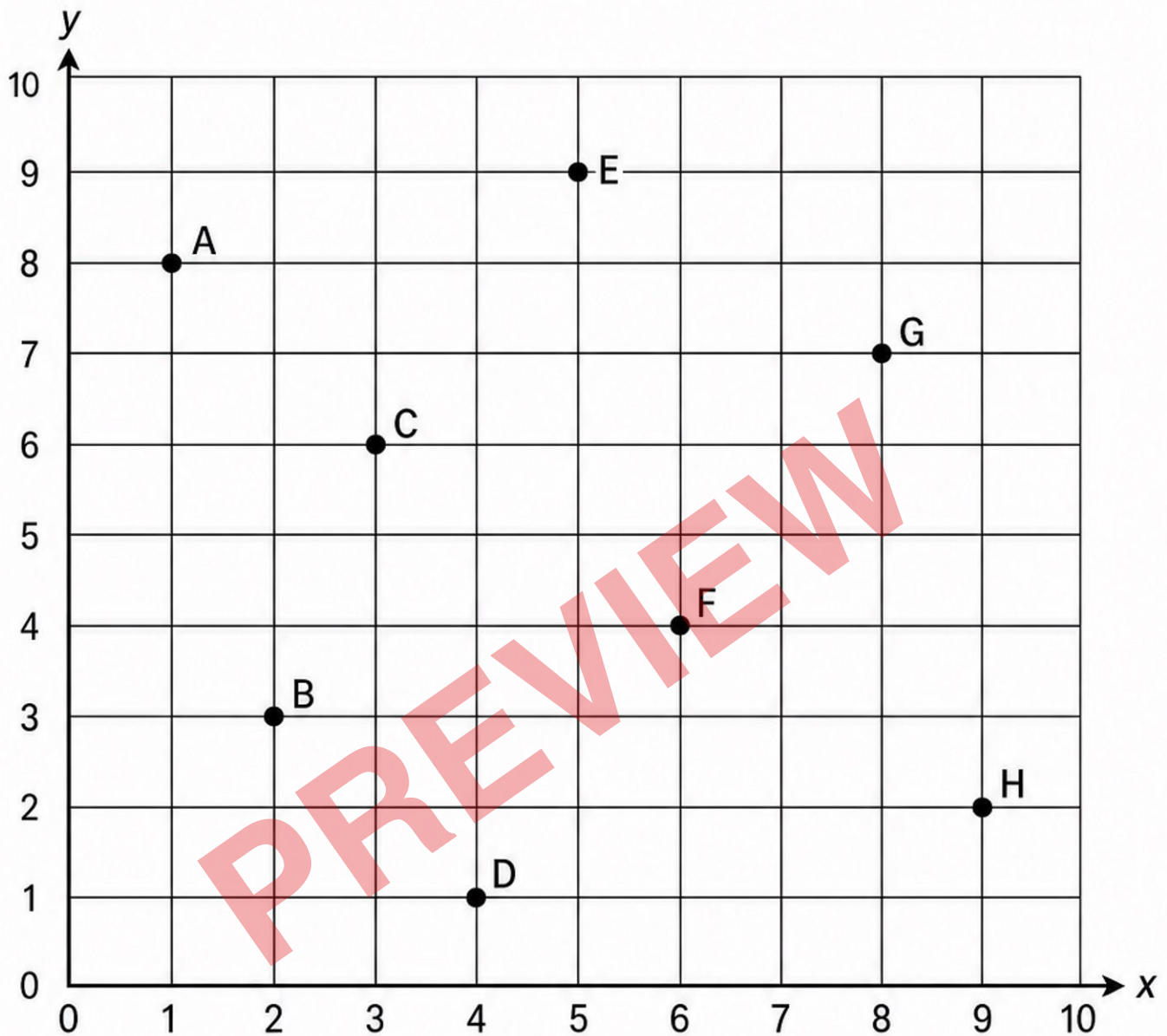
D: _____

H: _____

Why does the order of the numbers matter in an ordered pair?

Read the Grid – First Quadrant

Write the ordered pair for each labelled point. Remember: across first, then up.

A: (1, 8)E: (5, 9)B: (2, 3)F: (6, 4)C: (3, 6)G: (8, 7)D: (4, 1)H: (9, 2)

Why does the order of the numbers matter in an ordered pair?

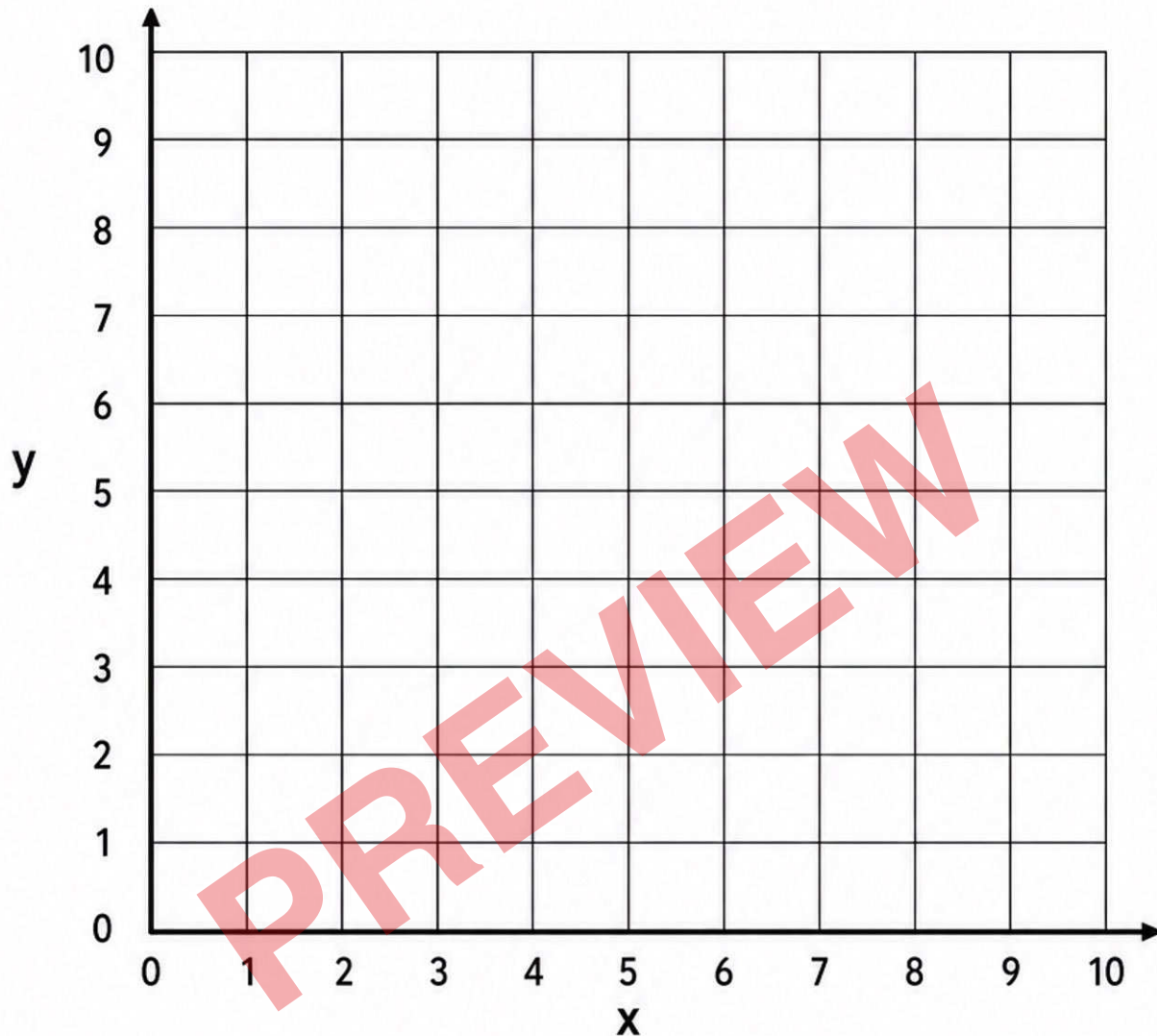
The first number gives x and the second gives y, so
changing the order changes the point.

Name: _____

Date: _____

Plot It – First Quadrant

Plot and label each point on the grid. Use a ruler and check x before y.



A (1, 4)

B (2, 9)

C (3, 2)

D (4, 7)

E (6, 1)

F (7, 8)

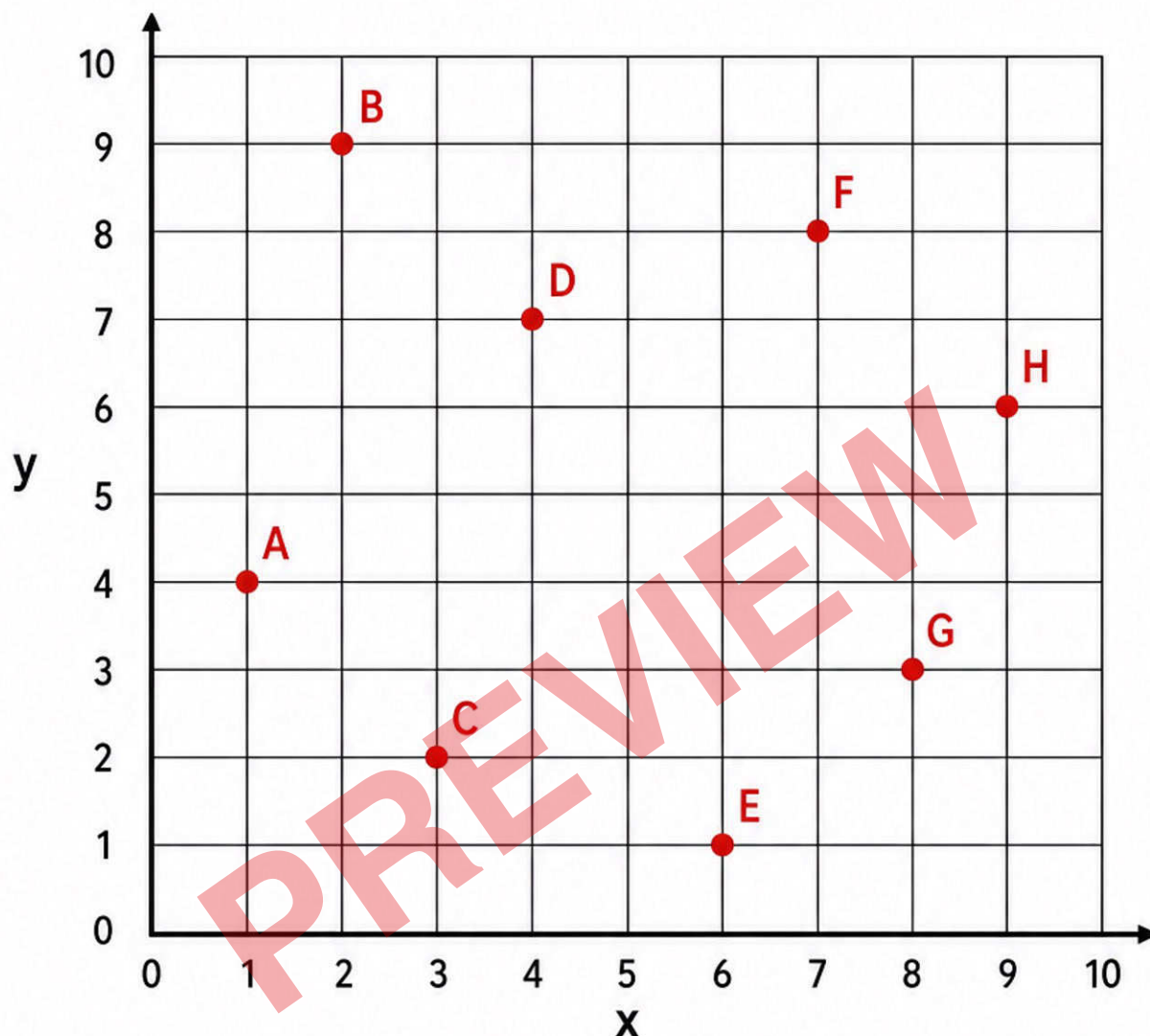
G (8, 3)

H (9, 6)

Which two points have the greatest vertical distance between them? Explain.

Plot It – First Quadrant

Plot and label each point on the grid. Use a ruler and check x before y.



A (1, 4)

B (2, 9)

C (3, 2)

D (4, 7)

E (6, 1)

F (7, 8)

G (8, 3)

H (9, 6)

Which two points have the greatest vertical distance between them? Explain.

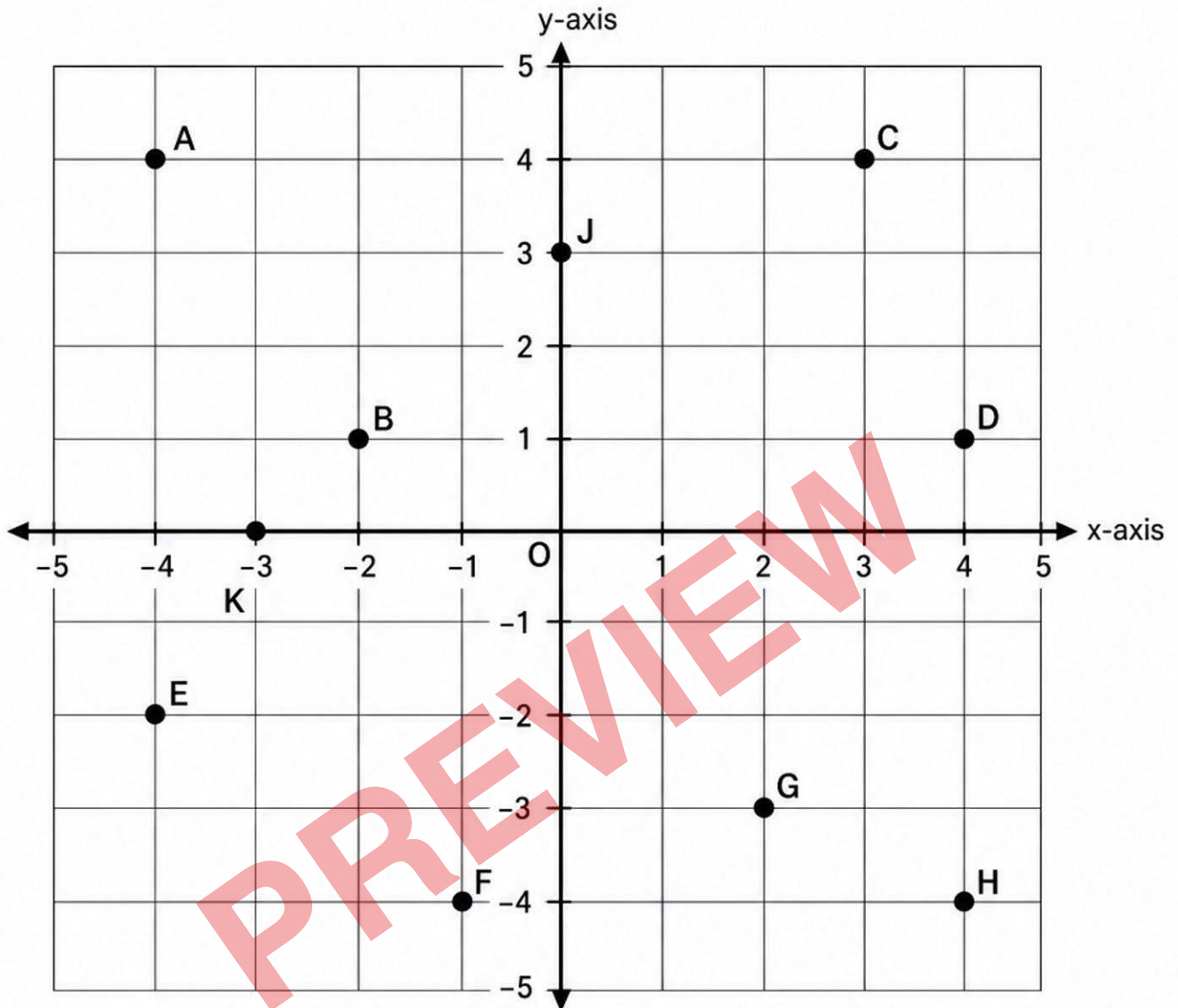
B and E; their y-values are 9 and 1, a vertical distance of 8 units.

Name: _____

Date: _____

Four-Quadrant Detective

For each labelled point, write its ordered pair and name its quadrant or axis.

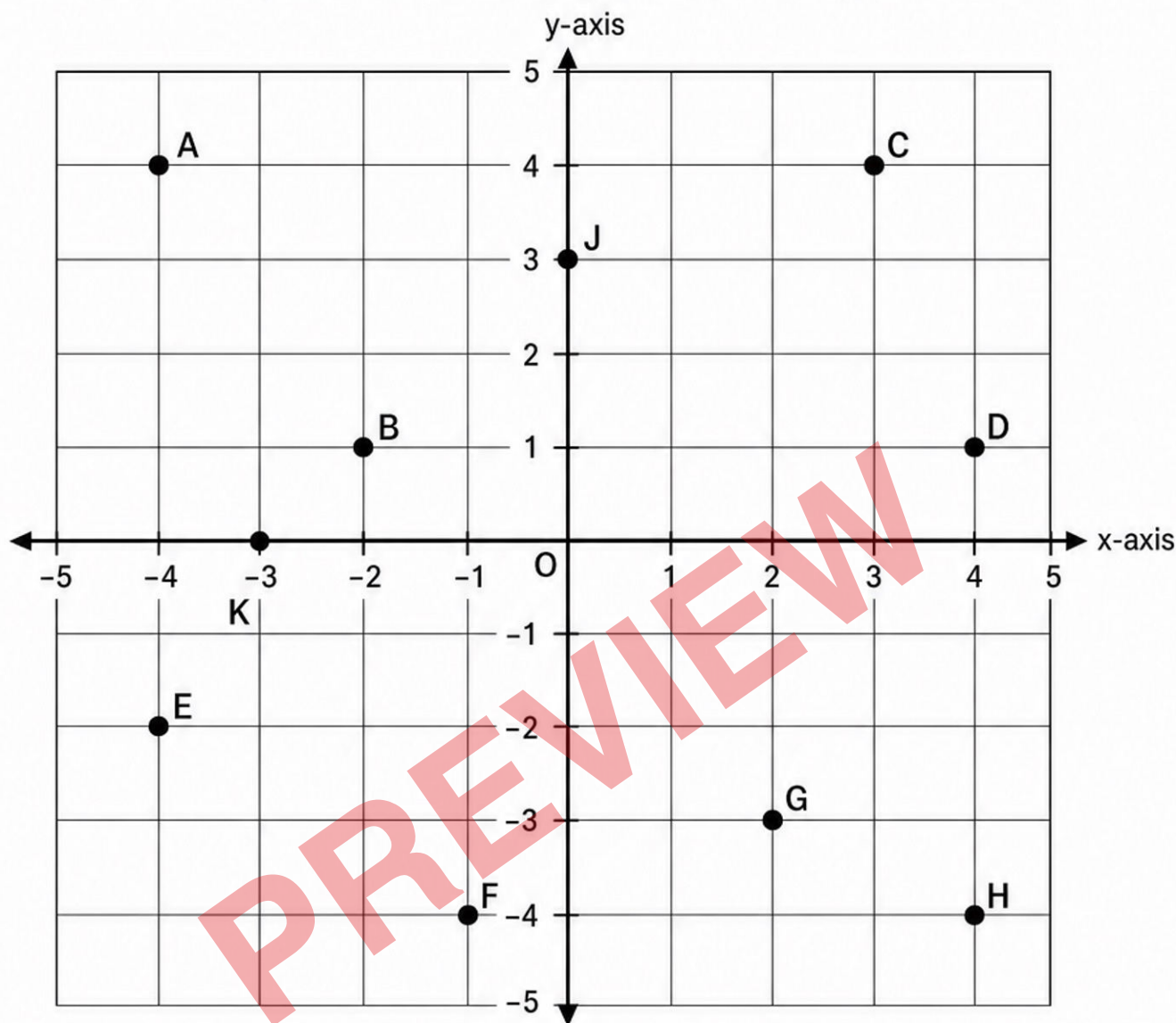


Point	Ordered pair	Quadrant or axis
A		
B		
C		
D		
E		
F		
G		
H		
J		
K		

Quadrants are named I, II, III and IV.

Four-Quadrant Detective

For each labelled point, write its ordered pair and name its quadrant or axis.



Point	Ordered pair	Quadrant or axis
A	$(-4, 4)$	Quadrant II
B	$(-2, 1)$	Quadrant II
C	$(3, 4)$	Quadrant I
D	$(4, 1)$	Quadrant I
E	$(-4, -2)$	Quadrant III
F	$(-1, -4)$	Quadrant III
G	$(2, -3)$	Quadrant IV
H	$(4, -4)$	Quadrant IV
J	$(0, 3)$	y-axis
K	$(-3, 0)$	x-axis

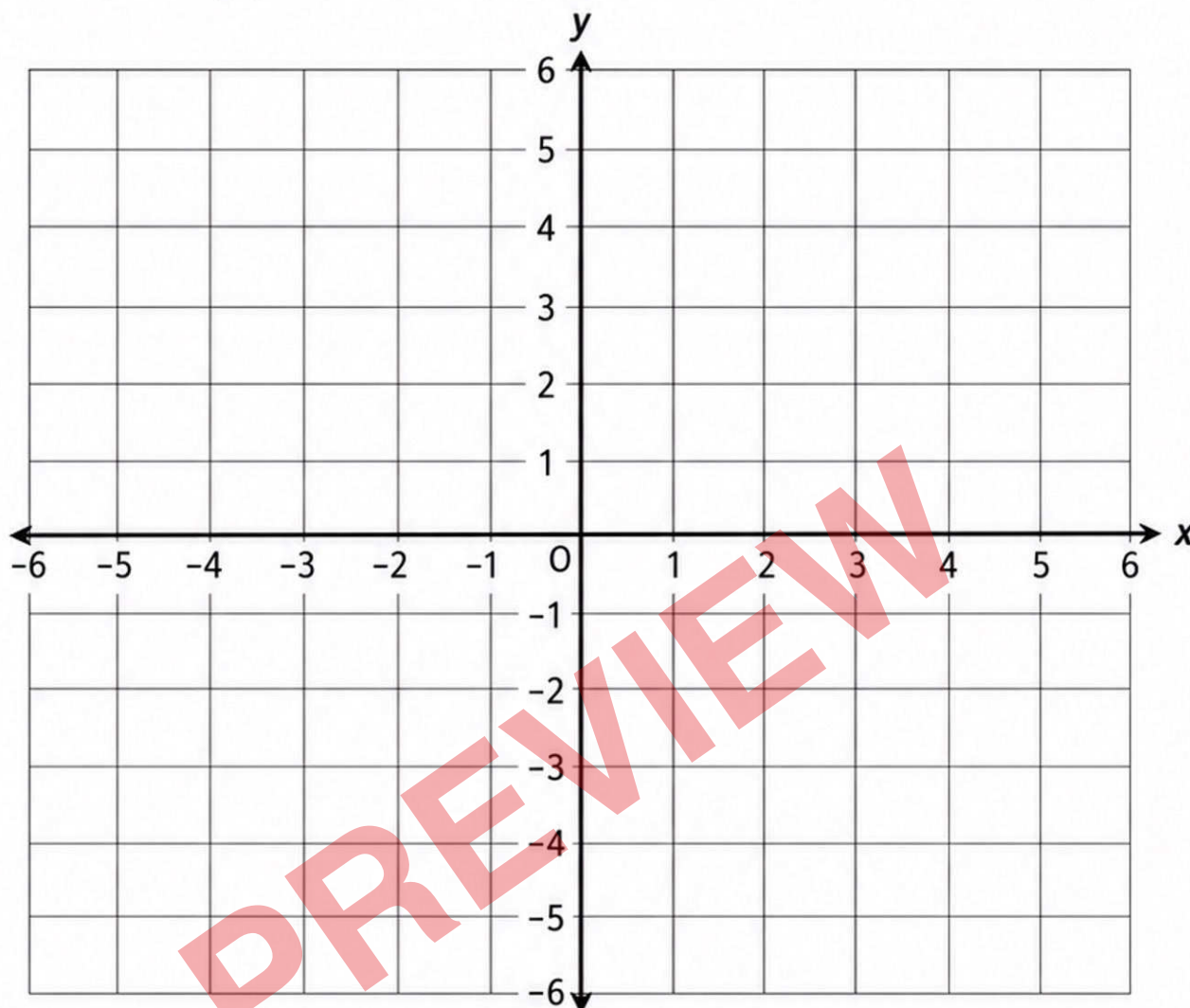
Quadrants are named I, II, III and IV.

Name: _____

Date: _____

Move the Point

Plot each start point. Apply the movement, draw an arrow and record the new ordered pair.



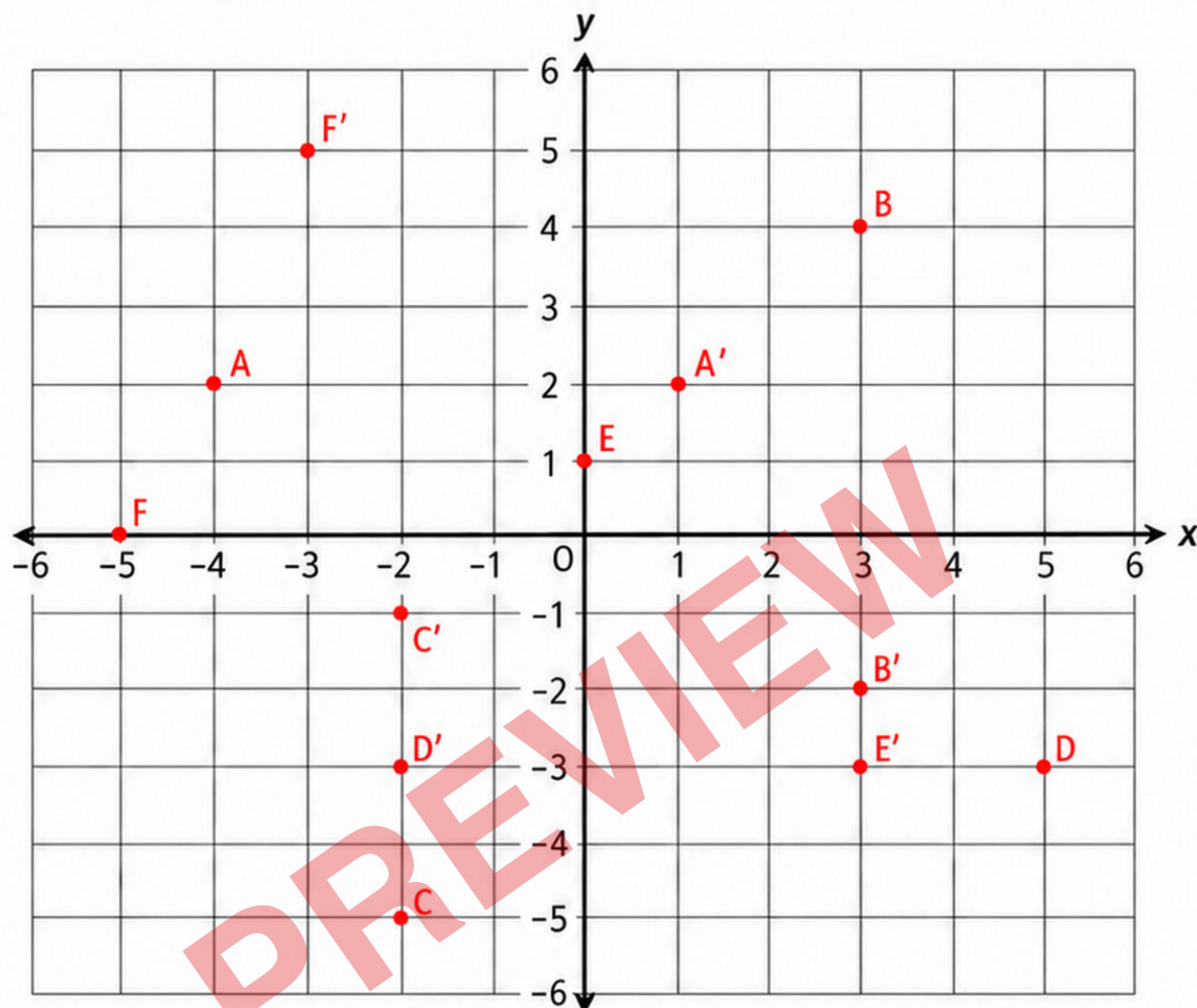
Start	Movement	New ordered pair
A (-4, 2)	5 right	
B (3, 4)	6 down	
C (-2, -5)	4 up	
D (5, -3)	7 left	
E (0, 1)	3 right, 4 down	
F (-5, 0)	2 right, 5 up	

Which coordinate changes during a horizontal move? _____

Which coordinate changes during a vertical move? _____

Move the Point

Plot each start point. Apply the movement, draw an arrow and record the new ordered pair.



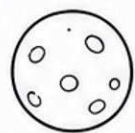
Start	Movement	New ordered pair
A (-4, 2)	5 right	A' (1, 2)
B (3, 4)	6 down	B' (3, -2)
C (-2, -5)	4 up	C' (-2, -1)
D (5, -3)	7 left	D' (-2, -3)
E (0, 1)	3 right, 4 down	E' (3, -3)
F (-5, 0)	2 right, 5 up	F' (-3, 5)

Which coordinate changes during a horizontal move? x-coordinate

Which coordinate changes during a vertical move? y-coordinate



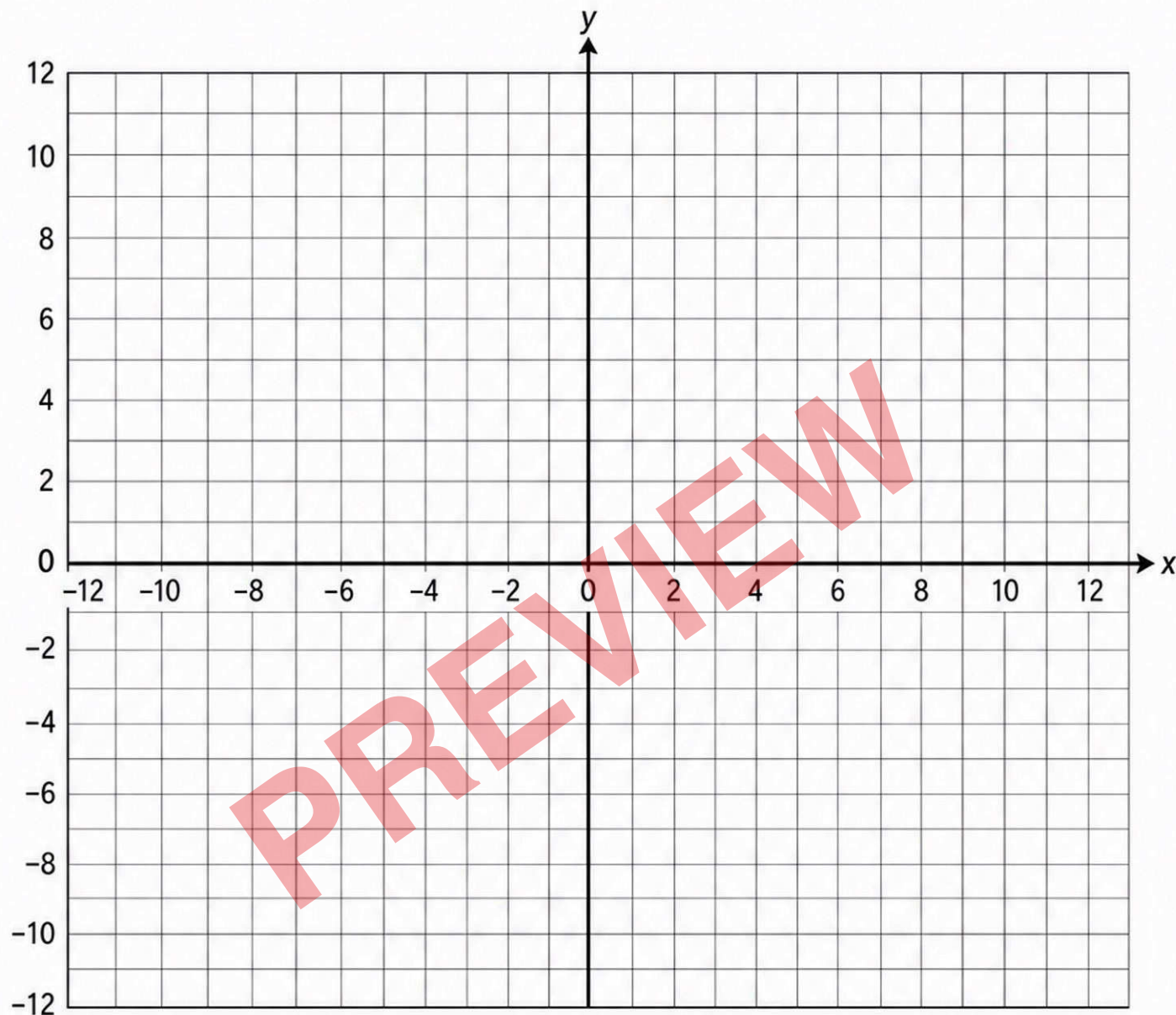
Coordinate Art – Space Rover



Name: _____

Date: _____

Plot each sequence in order. Join consecutive points with a ruler. Begin a new line for each sequence.



1 Body: $(-6, -3)$, $(6, -3)$, $(6, 4)$, $(-6, 4)$, $(-6, -3)$

2 Cabin: $(-5, 4)$, $(-3, 7)$, $(3, 7)$, $(5, 4)$

3 Left wheel: $(-5, -4)$, $(-4, -6)$, $(-3, -4)$, $(-4, -3)$, $(-5, -4)$

4 Right wheel: $(3, -4)$, $(4, -6)$, $(5, -4)$, $(4, -3)$, $(3, -4)$

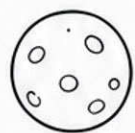
5 Antenna: $(1, 7)$, $(1, 9)$, $(2, 10)$

Add one original detail and list its coordinates.





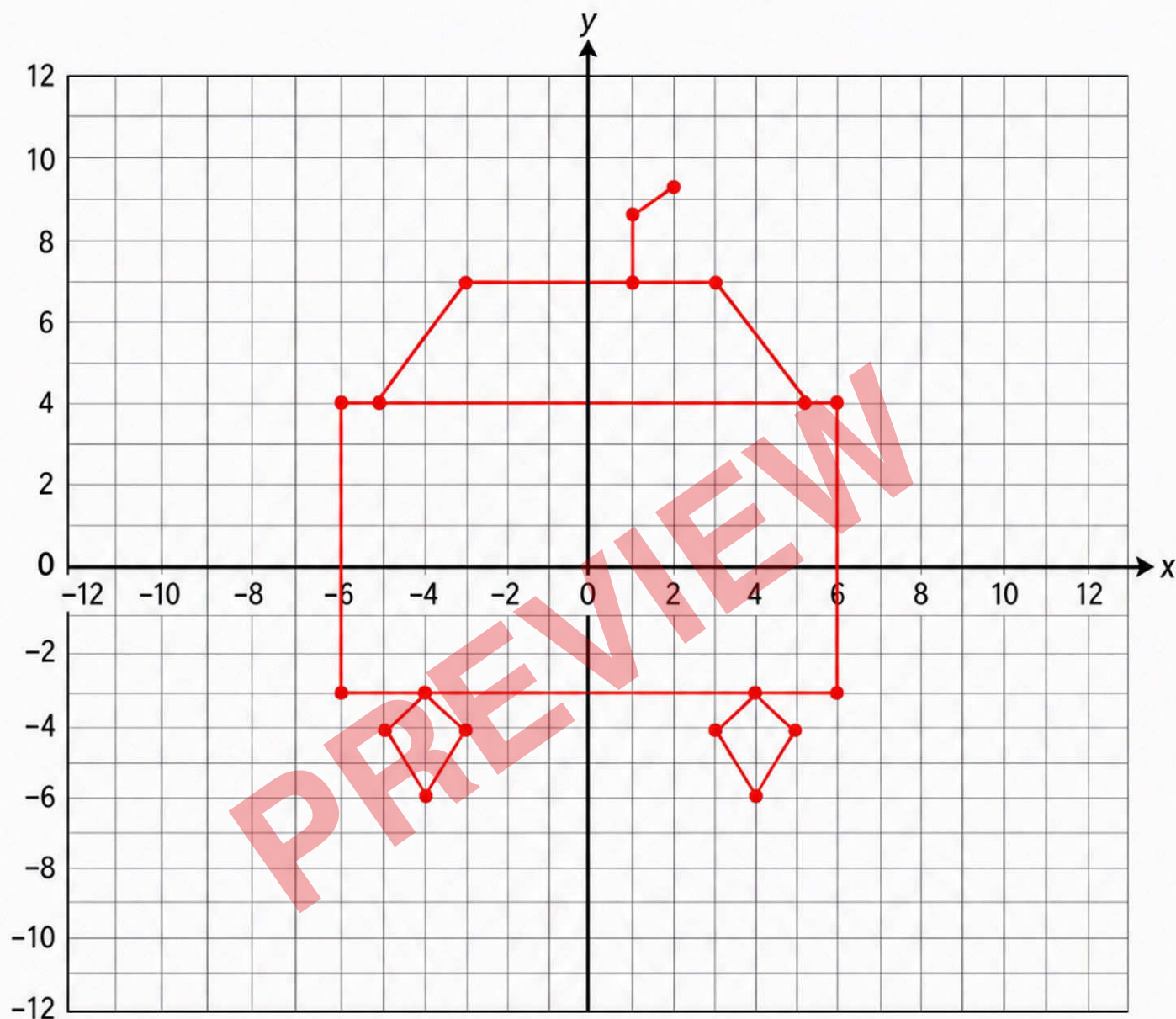
Coordinate Art – Space Rover



ANSWERS _____

Date: _____

Plot each sequence in order. Join consecutive points with a ruler. Begin a new line for each sequence.



1 Body: $(-6, -3)$, $(6, -3)$, $(6, 4)$, $(-6, 4)$, $(-6, -3)$

2 Cabin: $(-5, 4)$, $(-3, 7)$, $(3, 7)$, $(5, 4)$

3 Left wheel: $(-5, -4)$, $(-4, -6)$, $(-3, -4)$, $(-4, -3)$, $(-5, -4)$

4 Right wheel: $(3, -4)$, $(4, -6)$, $(5, -4)$, $(4, -3)$, $(3, -4)$

5 Antenna: $(1, 7)$, $(1, 9)$, $(2, 10)$

Add one original detail and list its coordinates.



- **Answers will vary.** _____

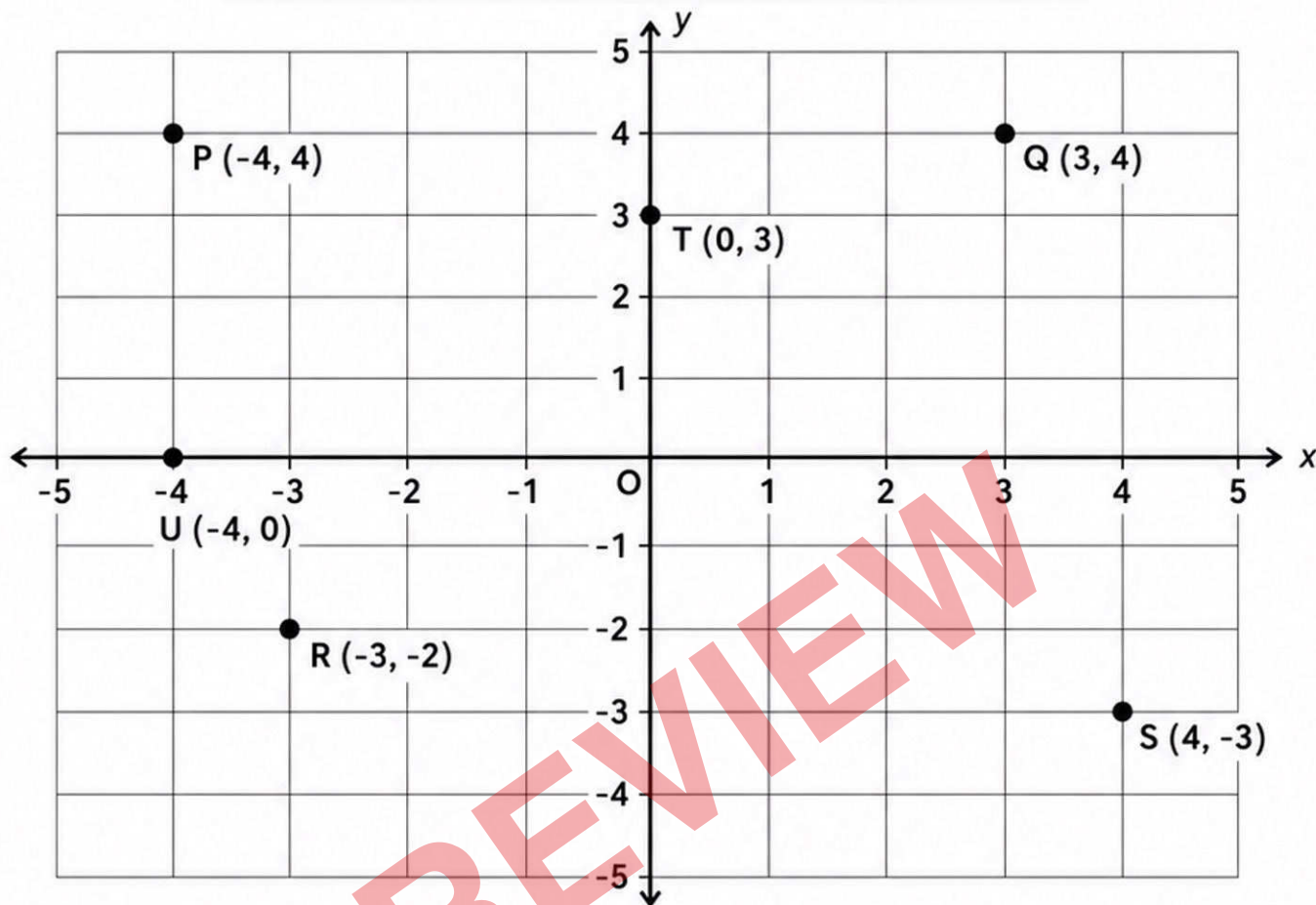
Cartesian Coordinates Check-Up – Page 1

Name: _____

Date: _____

Year 6 Mathematics • AC9M6SP02

Read, record and plot points in all four quadrants.



1. Write the ordered pair for P.
2. Write the ordered pair for Q.
3. Write the ordered pair for R.
4. Write the ordered pair for S.
5. Where is T located: quadrant or axis?
6. Where is U located: quadrant or axis?
7. Plot and label V at (2, -4).
8. Plot and label W at (-2, 3).
9. Write the coordinates of the origin.
10. Explain why (-3, 2) and (2, -3) are different points.

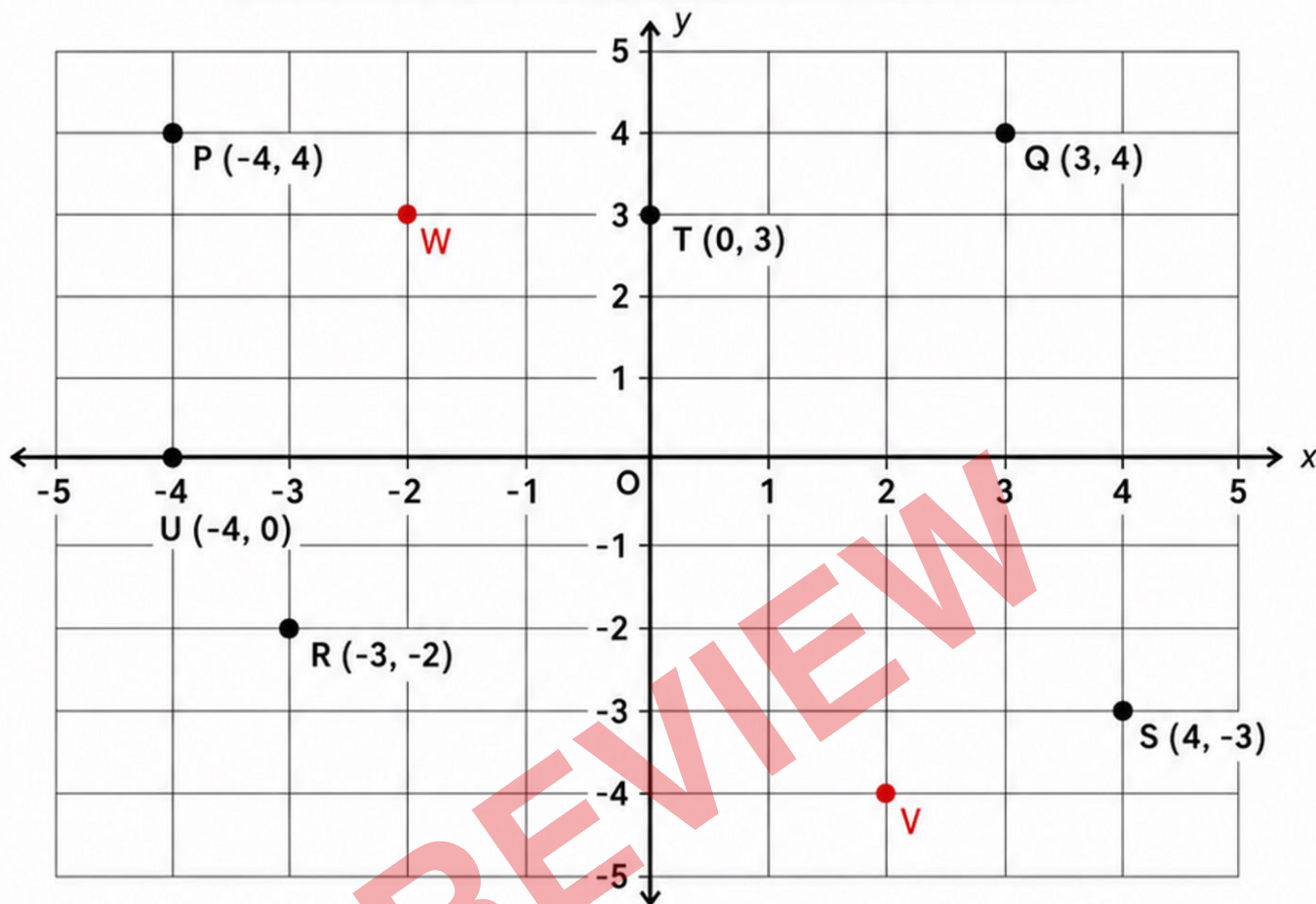
Cartesian Coordinates Check-Up – Page 1

ANSWERS _____

Date: _____

Year 6 Mathematics • AC9M6SP02

Read, record and plot points in all four quadrants.



1. Write the ordered pair for P. (-4, 4)
2. Write the ordered pair for Q. (3, 4)
3. Write the ordered pair for R. (-3, -2)
4. Write the ordered pair for S. (4, -3)
5. Where is T located: quadrant or axis? y-axis
6. Where is U located: quadrant or axis? x-axis
7. Plot and label V at (2, -4).
8. Plot and label W at (-2, 3).
9. Write the coordinates of the origin. (0, 0)
10. Explain why (-3, 2) and (2, -3) are different points. The first number is x and the second is y, so the two points are in different positions.

Cartesian Coordinates Check-Up – Page 2

Name: _____

Date: _____

Year 6 Mathematics • AC9M6SP02

Describe coordinate changes and justify your reasoning.

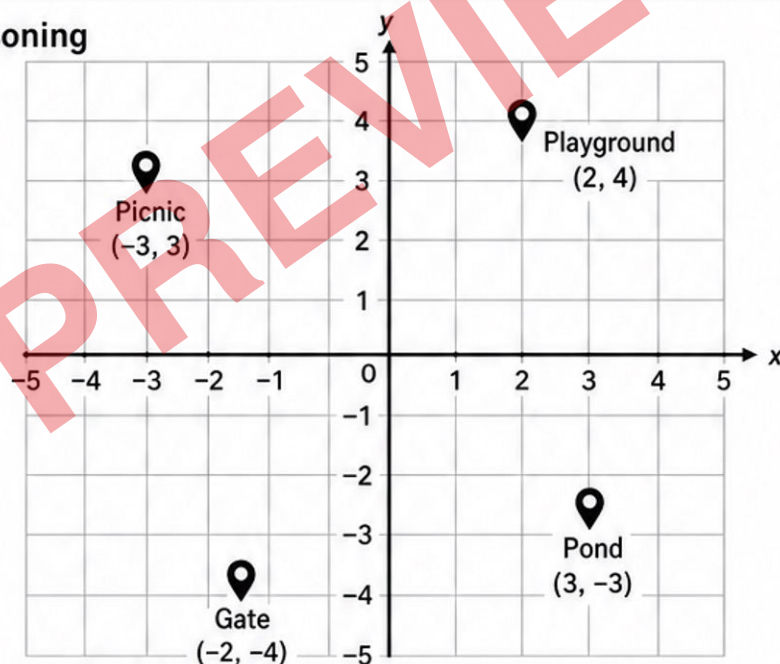
A. Move and reflect

Start point	Change	New point
$(-3, 2)$	5 units right	
$(4, 3)$	6 units down	
$(-2, -4)$	Reflect across the x-axis	
$(5, -1)$	Reflect across the y-axis	

B. Find the error

Mia says the point $(-5, 2)$ is in Quadrant IV. Is Mia correct? Explain and correct the quadrant.

C. Park map reasoning



1. Which place is in Quadrant III?

2. Describe the coordinate change from Picnic to Playground.

3. The gate moves 4 units right. What are its new coordinates?

I checked x before y: Yes / Not yet

Cartesian Coordinates Check-Up – Page 2

ANSWERS

Date: _____

Year 6 Mathematics • AC9M6SP02

Describe coordinate changes and justify your reasoning.

A. Move and reflect

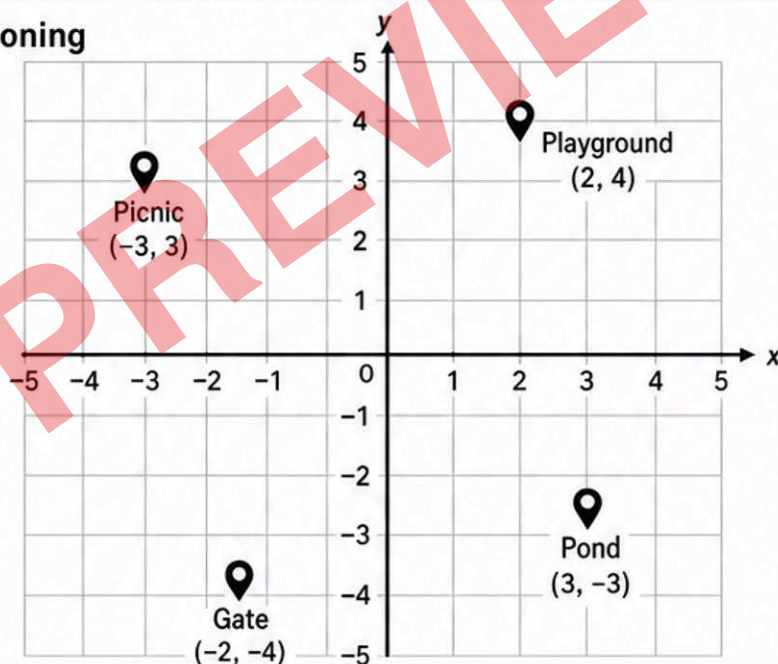
Start point	Change	New point
$(-3, 2)$	5 units right	$(2, 2)$
$(4, 3)$	6 units down	$(4, -3)$
$(-2, -4)$	Reflect across the x-axis	$(-2, 4)$
$(5, -1)$	Reflect across the y-axis	$(-5, -1)$

B. Find the error

Mia says the point $(-5, 2)$ is in Quadrant IV. Is Mia correct? Explain and correct the quadrant.

No. The x-coordinate is negative and the y-coordinate is positive, so $(-5, 2)$ is in Quadrant II.

C. Park map reasoning



1. Which place is in Quadrant III?

Gate.

2. Describe the coordinate change from Picnic to Playground.

Move 5 units right and 1 unit up.

3. The gate moves 4 units right. What are its new coordinates?

$(2, -4)$.

I checked x before y: Yes ☒ Not yet ☐

Student: _____ Date: _____

AC9M6SP02

Cartesian Coordinates Year 6 Rubric

Criteria	BEGINNING	DEVELOPING	ACHIEVING	CONFIDENT	EXCEEDING
1 Ordered pairs	Needs support to read x and y.	Reads some ordered pairs.	Reads ordered pairs accurately.	Reads and checks ordered pairs accurately.	Explains coordinate order and detects errors.
2 Plotting and locating	Plots with significant support.	Plots some points correctly.	Plots and locates points accurately.	Plots efficiently and checks positions.	Creates and verifies complex plotted designs.
3 Four quadrants	Recognises one quadrant.	Names some quadrants.	Uses all four quadrants correctly.	Classifies points, axes and origin accurately.	Justifies locations using coordinate signs.
4 Coordinate changes	Needs support to describe moves.	Describes simple horizontal or vertical moves.	Updates coordinates after horizontal and vertical moves.	Explains which coordinate changes and why.	Generalises movement and reflection rules.
5 Reasoning and communication	Gives limited working.	Gives a partly clear explanation.	Uses correct notation and clear reasoning.	Justifies answers with precise mathematical language.	Compares strategies and communicates insightfully.

Overall judgement:

☐

BEGINNING

☐

DEVELOPING

☐

ACHIEVING

☐

CONFIDENT

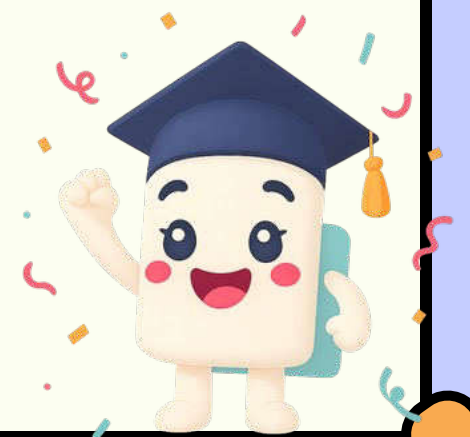
☐

EXCEEDING

Teacher feedback: _____

Why coordinates?

Coordinates describe an exact position on a plane.
They are used in maps, games, design and data.
By the end, you will read, plot and move points.

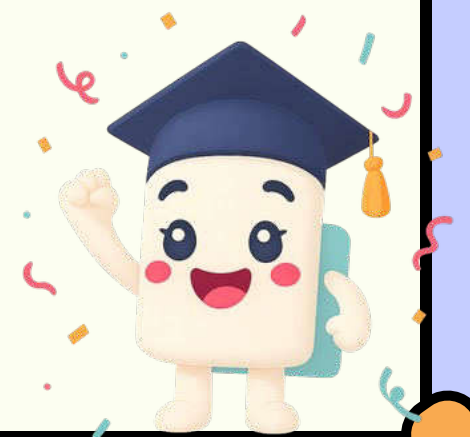


Meet the plane

The x-axis runs horizontally.

The y-axis runs vertically.

The axes meet at the origin: $(0, 0)$.



Across first

An ordered pair is written (x, y) .

Move across to x first.

Then move up or down to y .

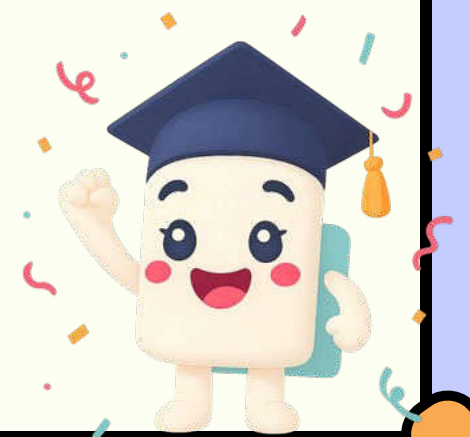


Four quadrants

I: (+, +) II: (-, +)

III: (-, -) IV: (+, -)

Points on an axis are not in a quadrant.



Read a point

For $(-4, 3)$:

1. Move 4 units left.

2. Move 3 units up.

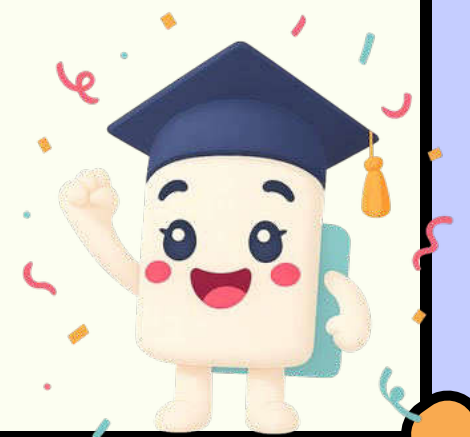
The point is in Quadrant II.



Plot a point

To plot $(3, -2)$:

1. Start at the origin.
2. Move 3 units right.
3. Move 2 units down.



Points on axes

If $x = 0$, the point lies on the y-axis.

If $y = 0$, the point lies on the x-axis.

The origin lies on both axes.



Move horizontally

A horizontal move changes x only.
 $(-3, 2)$ moved 5 right becomes $(2, 2)$.



Move vertically

A vertical move changes y only.
 $(4, 3)$ moved 6 down becomes $(4, -3)$.

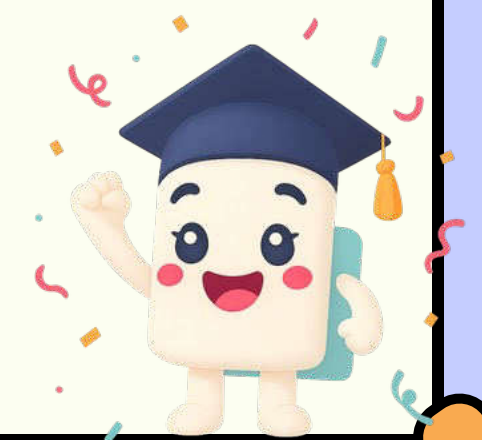


Reflect in x-axis

The x-coordinate stays the same.

The sign of y changes.

$(-2, -4)$ becomes $(-2, 4)$.



Reflect in y-axis

The y-coordinate stays the same.

The sign of x changes.

$(5, -1)$ becomes $(-5, -1)$.

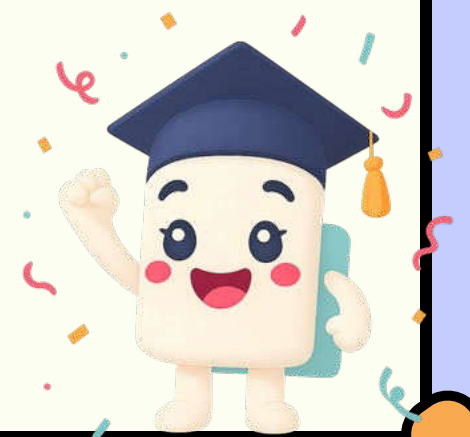


Coordinate challenge

Where would you plot $(-3, 4)$?

Which quadrant contains $(2, -5)$?

How does $(1, 3)$ change after 4 units left?



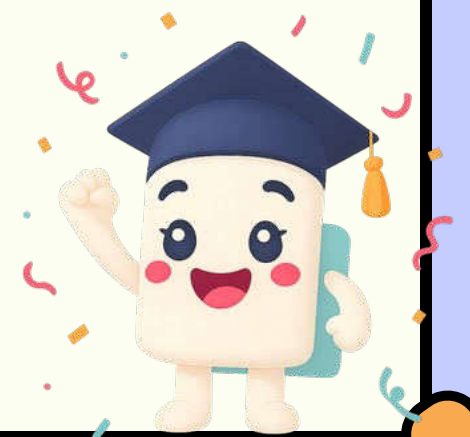
Accuracy checklist

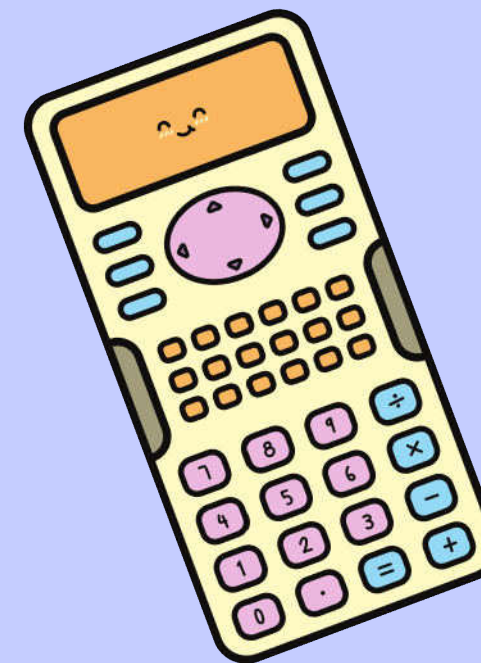
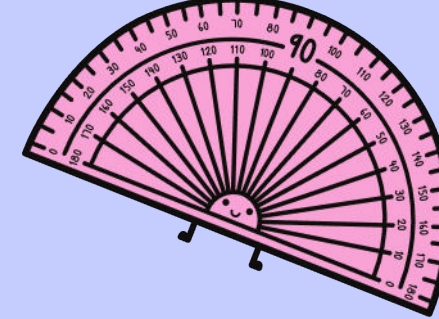
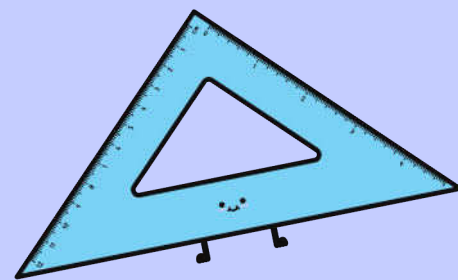
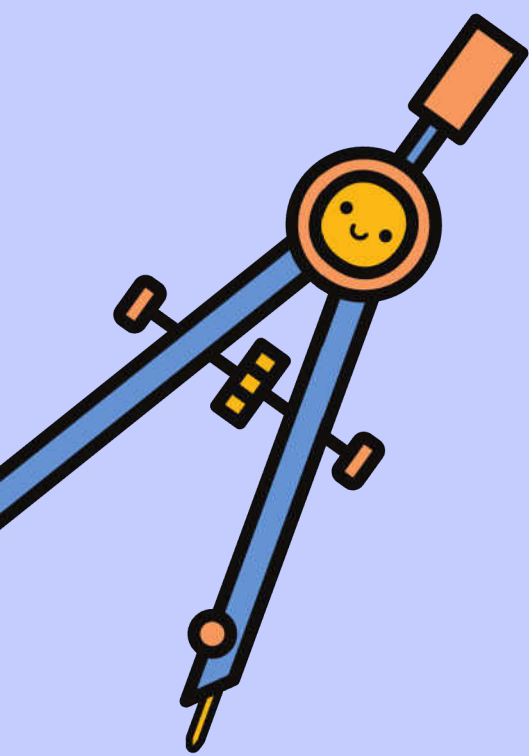
Check **x** before **y**.

Check every **minus** sign.

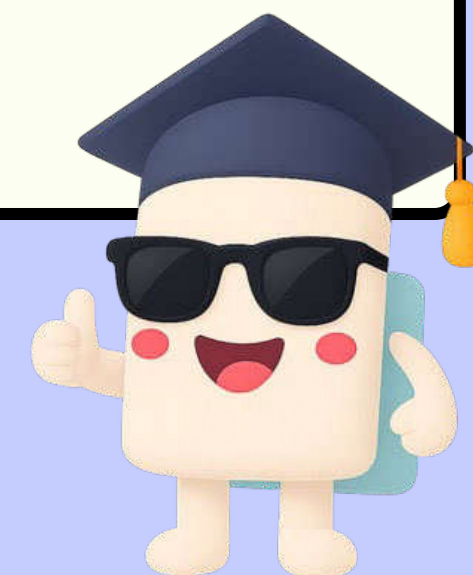
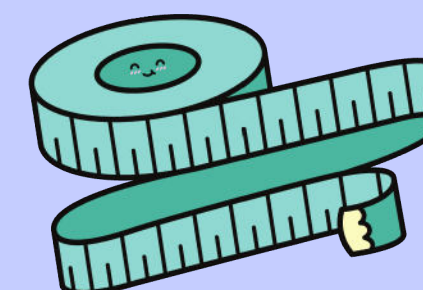
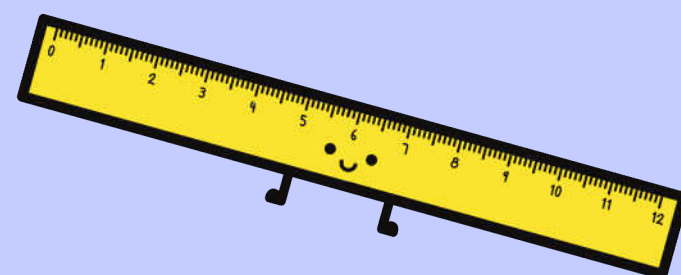
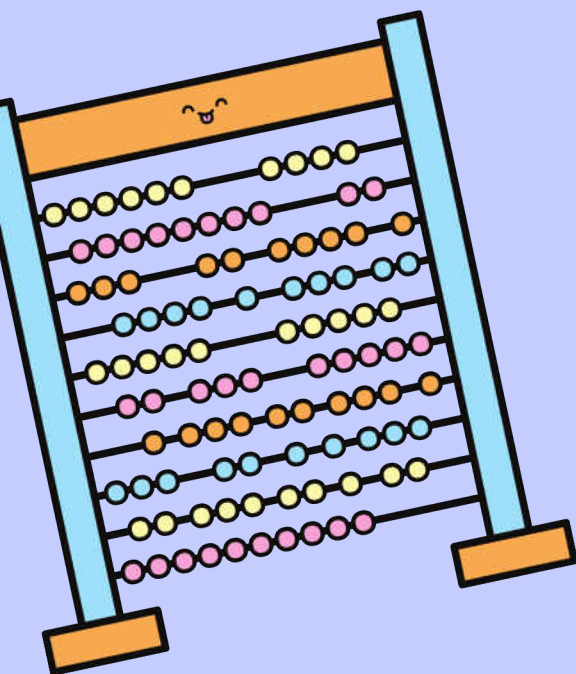
Name the quadrant or axis.

Re-read the movement direction.





Well Done!



Question 1

What are the coordinates of the origin?

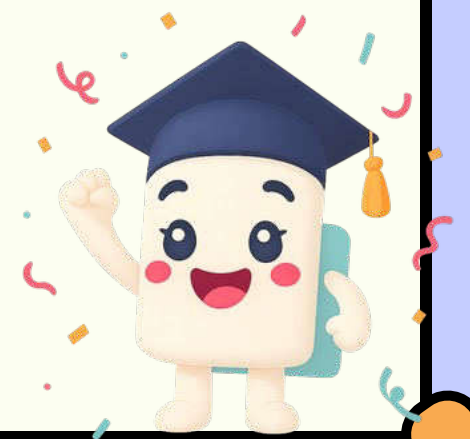
- A. (1, 0)
- B. (0, 1)
- C. (0, 0)
- D. (-1, -1)



Answer 1

c. $(0, 0)$

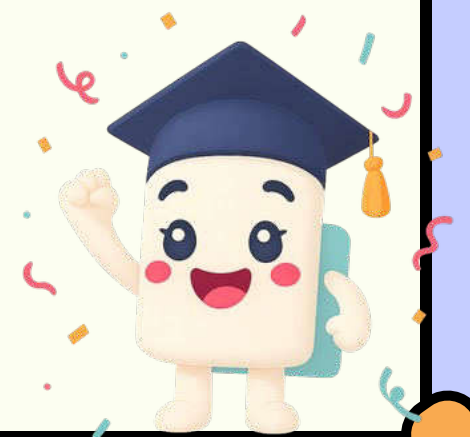
The axes meet at the origin.



Question 2

True or false?

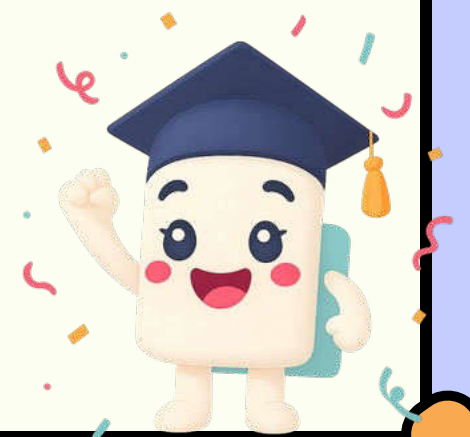
In an ordered pair, the first number is the y-coordinate.



Answer 2

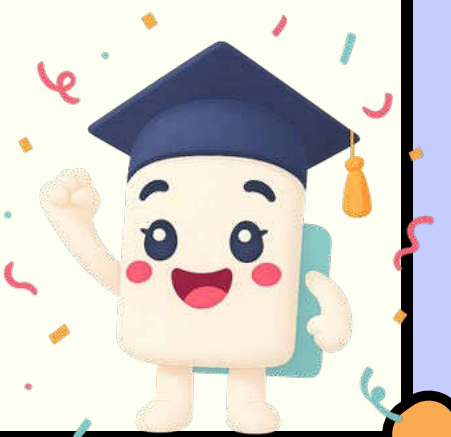
False.

The first number is x and the second number is y .



Question 3

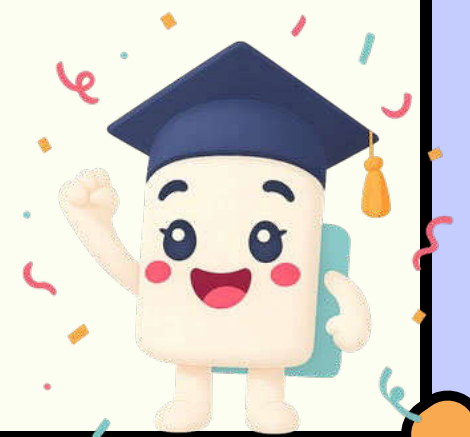
Which quadrant contains $(-4, 5)$?



Answer 3

Quadrant II.

The x-coordinate is negative and y is positive.



Question 4

Which point lies on the x-axis?

- A. (0, 6)
- B. (6, 0)
- C. (-2, 4)
- D. (3, -5)



Answer 4

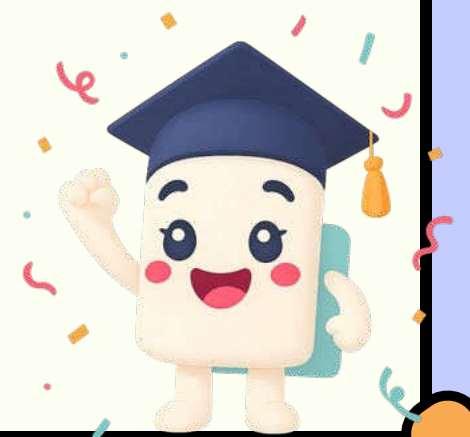
B. (6, 0)

A point lies on the x-axis when $y = 0$.



Question 5

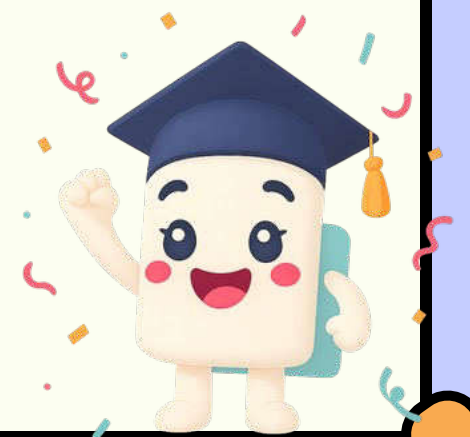
Move $(-2, 3)$ five units right.
What is the new ordered pair?



Answer 5

$(3, 3)$

Only the x-coordinate changes.



Question 6

Reflect $(4, -2)$ across the y -axis.

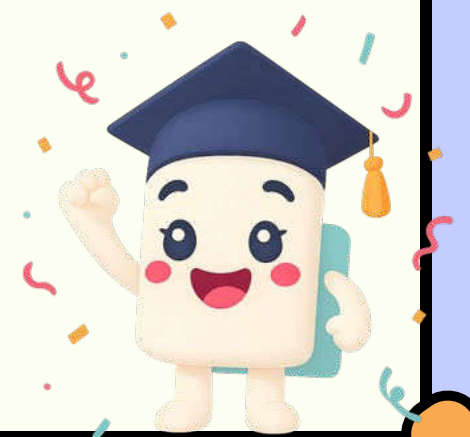
- A. $(4, 2)$
- B. $(-4, -2)$
- C. $(-4, 2)$
- D. $(2, -4)$



Answer 6

B. $(-4, -2)$

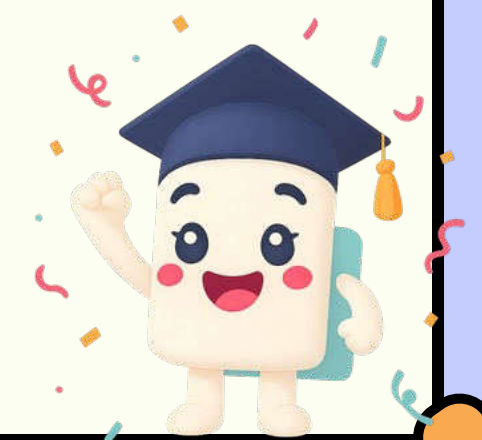
A y-axis reflection changes the sign of x.



Question 7

True or false?

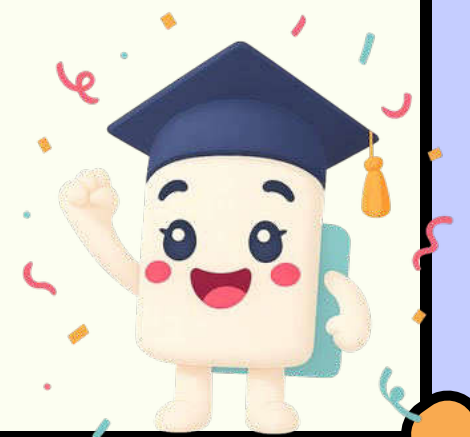
The point $(0, -5)$ is in Quadrant IV.



Answer 7

False.

Because $x = 0$, the point is on the y-axis.



Question 8

Move $(3, 4)$ six units down.
What is the new ordered pair?



Answer 8

$(3, -2)$

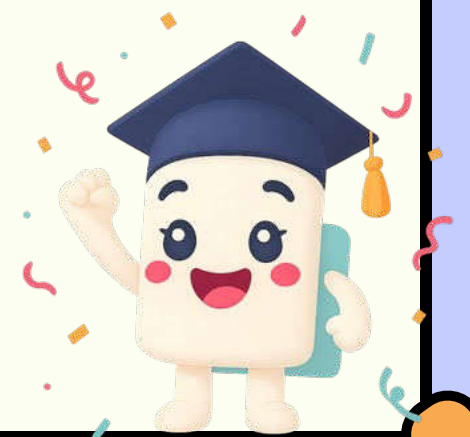
Only the y-coordinate changes.



Question 9

Which sign pattern describes Quadrant III?

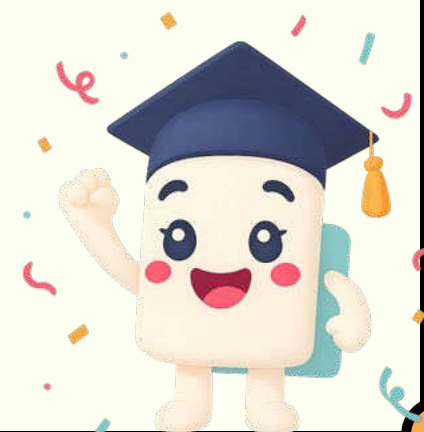
- A. $(+, +)$
- B. $(-, +)$
- C. $(-, -)$
- D. $(+, -)$



Answer 9

C. $(-, -)$

Both coordinates are negative in Quadrant III.



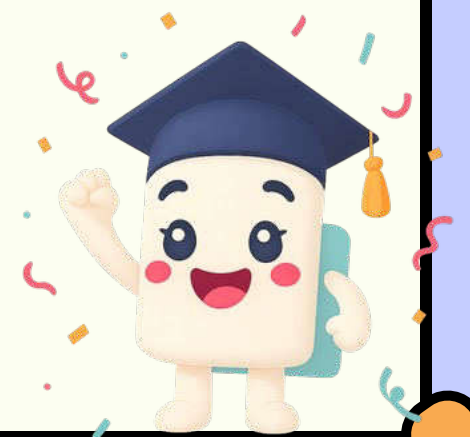
Question 10

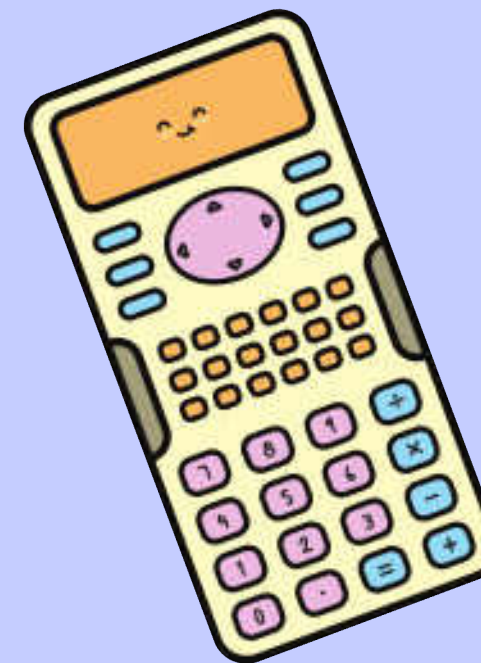
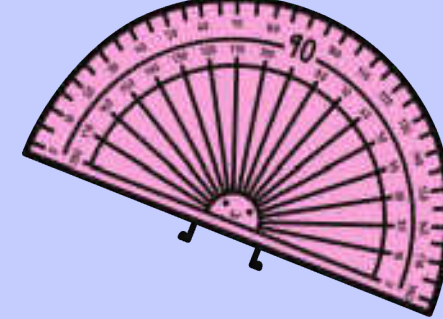
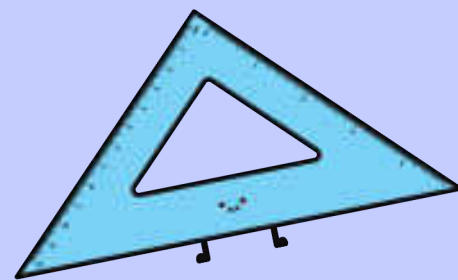
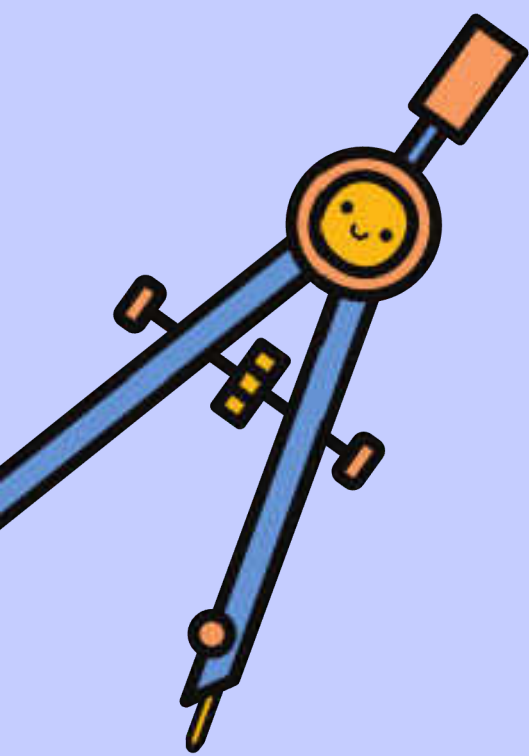
Why are $(-3, 2)$ and $(2, -3)$ different points?



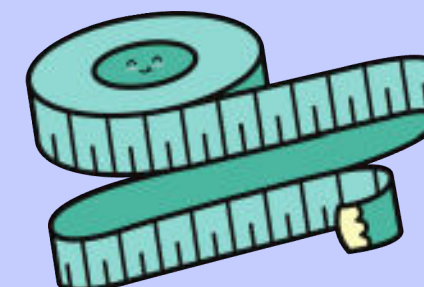
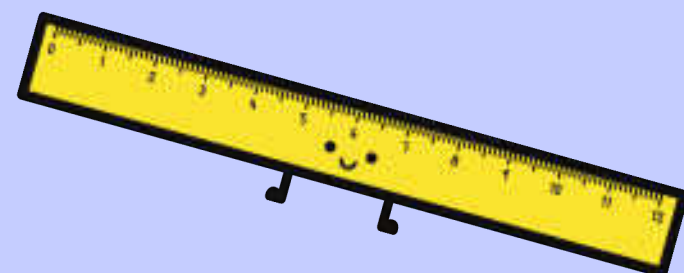
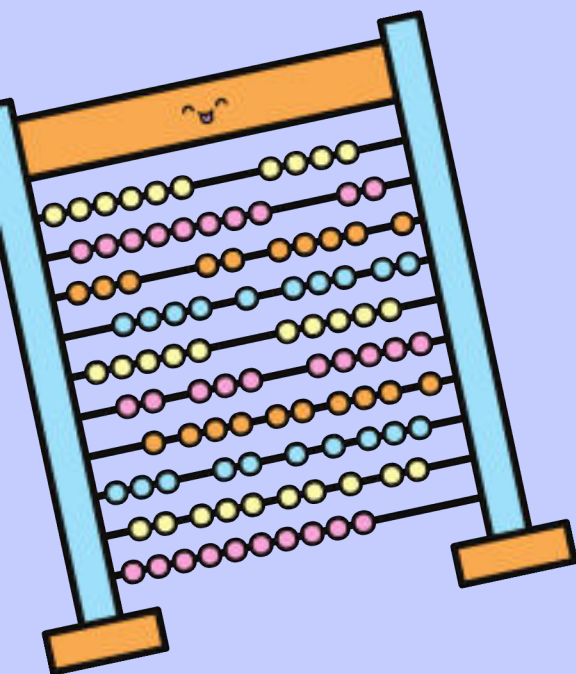
Answer 10

The coordinate order changes the location.
 $(-3, 2)$ is in Quadrant II; $(2, -3)$ is in Quadrant IV.





Great Work!



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Understanding Transformations - Year 6

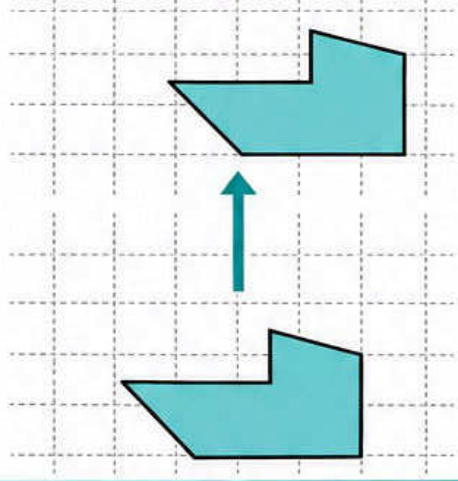
Table of Contents	
Presentation: Understanding Transformations	
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Worksheet 1: Transformation Foundations	
Worksheet 2: Translation Coordinates	
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Worksheet 4: Rotation Coordinates	
Worksheet 5: Combined Transformation Sequences	
Worksheet 6: Tessellation Detectives	
Game 1: Transformation Trail	
Activity: Tessellation Builders	
Quiz: Understanding Transformations	
Assessment: Pattern Pavilion Design Challenge	
Rubric: Understanding Transformations	



TRANSFORMATIONS TOOLKIT

TRANSLATION

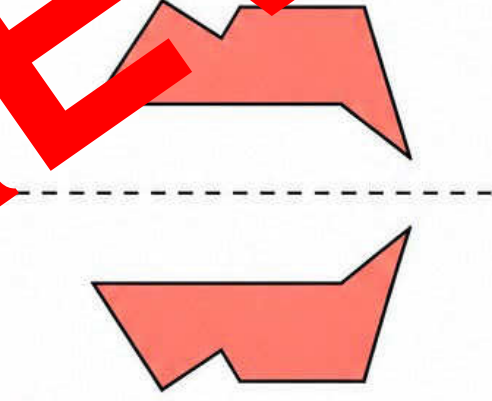
Slide every point the same distance and direction.



$$(x, y) \rightarrow (x + a, y + b)$$

REFLECTION

Flip across a mirror line.

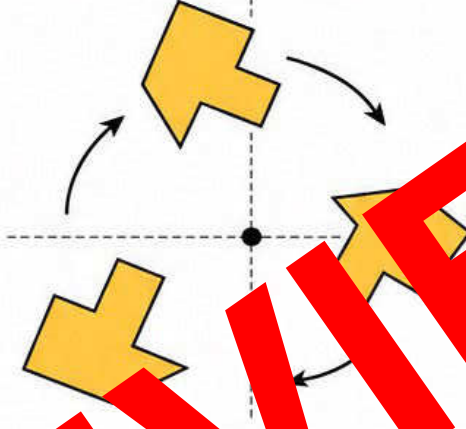


$$y\text{-axis: } (-x, y)$$

$$x\text{-axis: } (x, -y)$$

ROTATION

Turn around a fixed centre.



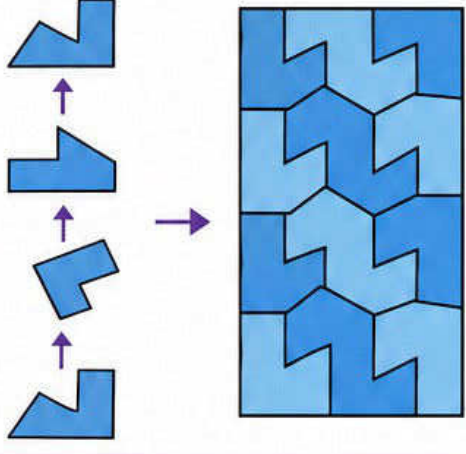
$$90^\circ \text{ clockwise: } (x, y) \rightarrow (y, -x)$$

$$180^\circ: (-x, -y)$$

$$90^\circ \text{ anticlockwise: } (x, y) \rightarrow (-y, x)$$

COMBINATIONS

Apply moves in order.

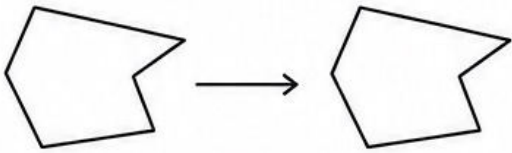
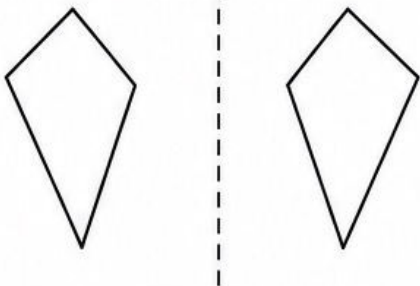
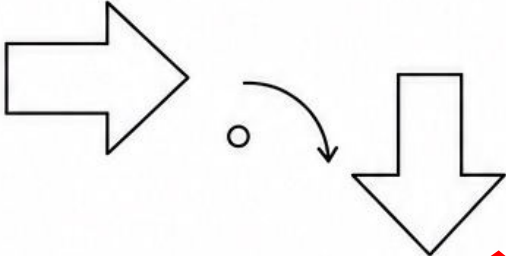
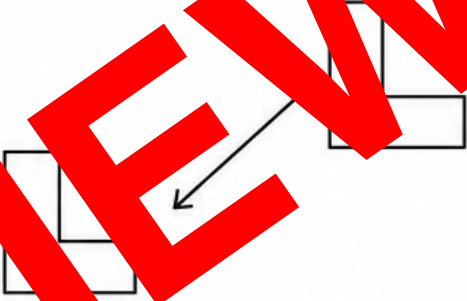
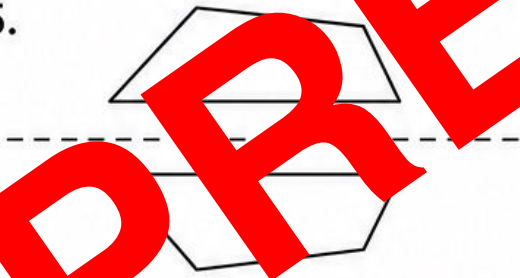
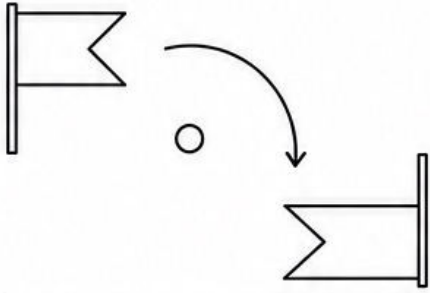


Tessellation = repeated shapes with no gaps or overlaps.

TRANSFORMATION FOUNDATIONS

Name: _____

Write T for translation, F for reflection or R for rotation.

1.  _____	2.  _____
3.  _____	4.  _____
5.  _____	6.  _____

What stays the same after every rigid transformation?

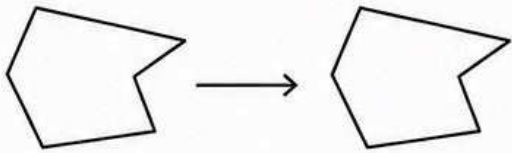
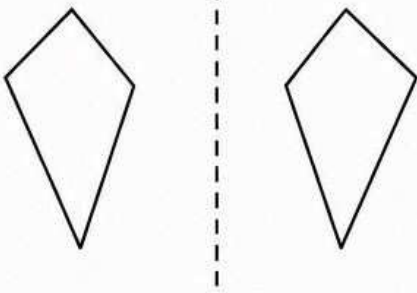
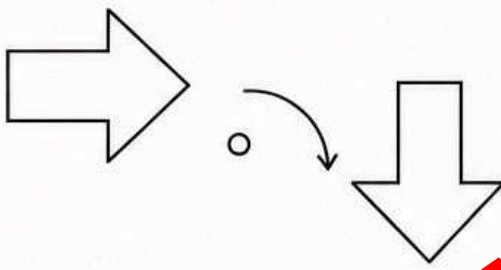
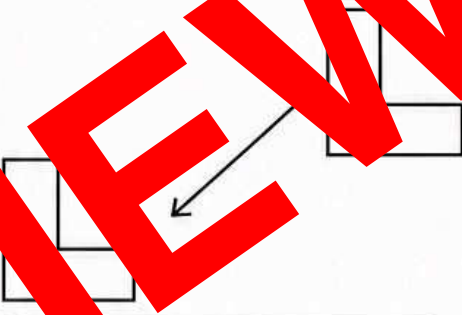
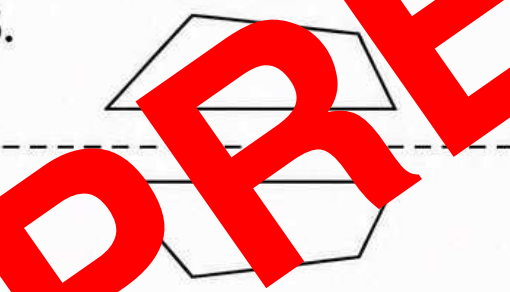
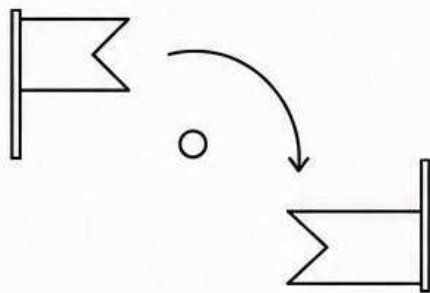
Which transformation reverses orientation?

How can you recognise a rotation?

TRANSFORMATION FOUNDATIONS

Name: **ANSWERS**

Write T for translation, F for reflection or R for rotation.

1.  T	2.  F
3.  R	4.  T
5.  F	6.  R

What stays the same after every rigid transformation?

Side lengths, angle sizes, shape and area. _____

Which transformation reverses orientation?

Reflection. _____

How can you recognise a rotation?

Every point turns through the same angle around a fixed centre. _____

TRANSLATION COORDINATES

Name: _____

1. Triangle ABC: A(-5,-2), B(-2,-2), C(-4,1).

Translate by vector (+6,+3).

Record A', B', C'. Check on the grid.

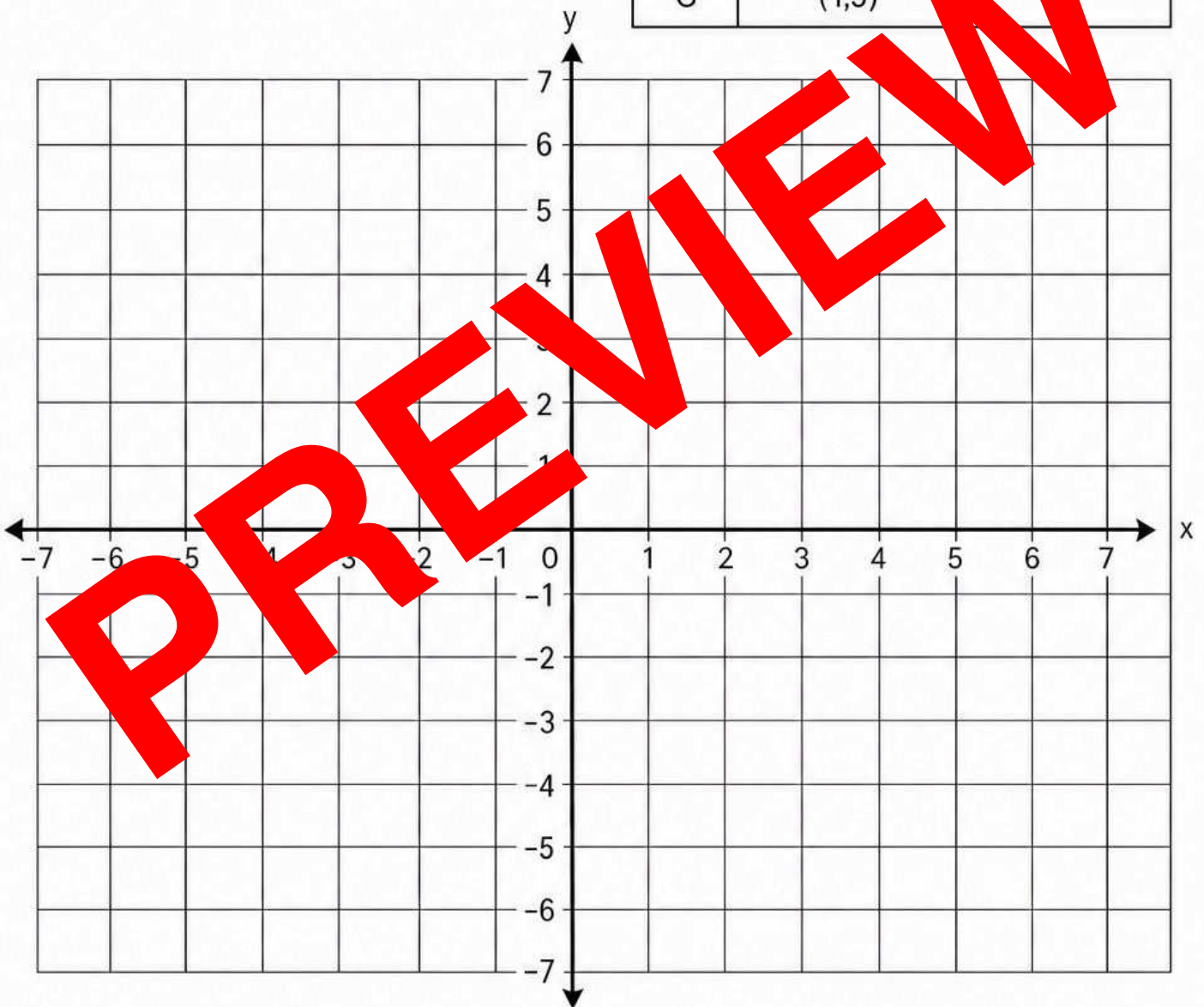
	Original	Image
A	(-5,-2)	
B	(-2,-2)	
C	(-4,1)	

2. Rectangle DEFG: D(1,3), E(4,3), F(4,5), G(1,5).

Translate by vector (-5,-6).

Record D', E', F', G'. Check on the grid.

	Original	Image
D	(1,3)	
E	(4,3)	
F	(4,5)	
G	(1,5)	



Write one sentence explaining how you checked the translation.

TRANSLATION COORDINATES

Name: **ANSWERS**

1. Triangle ABC: A(-5,-2), B(-2,-2), C(-4,1).

Translate by vector (+6,+3).

Record A', B', C'. Check on the grid.

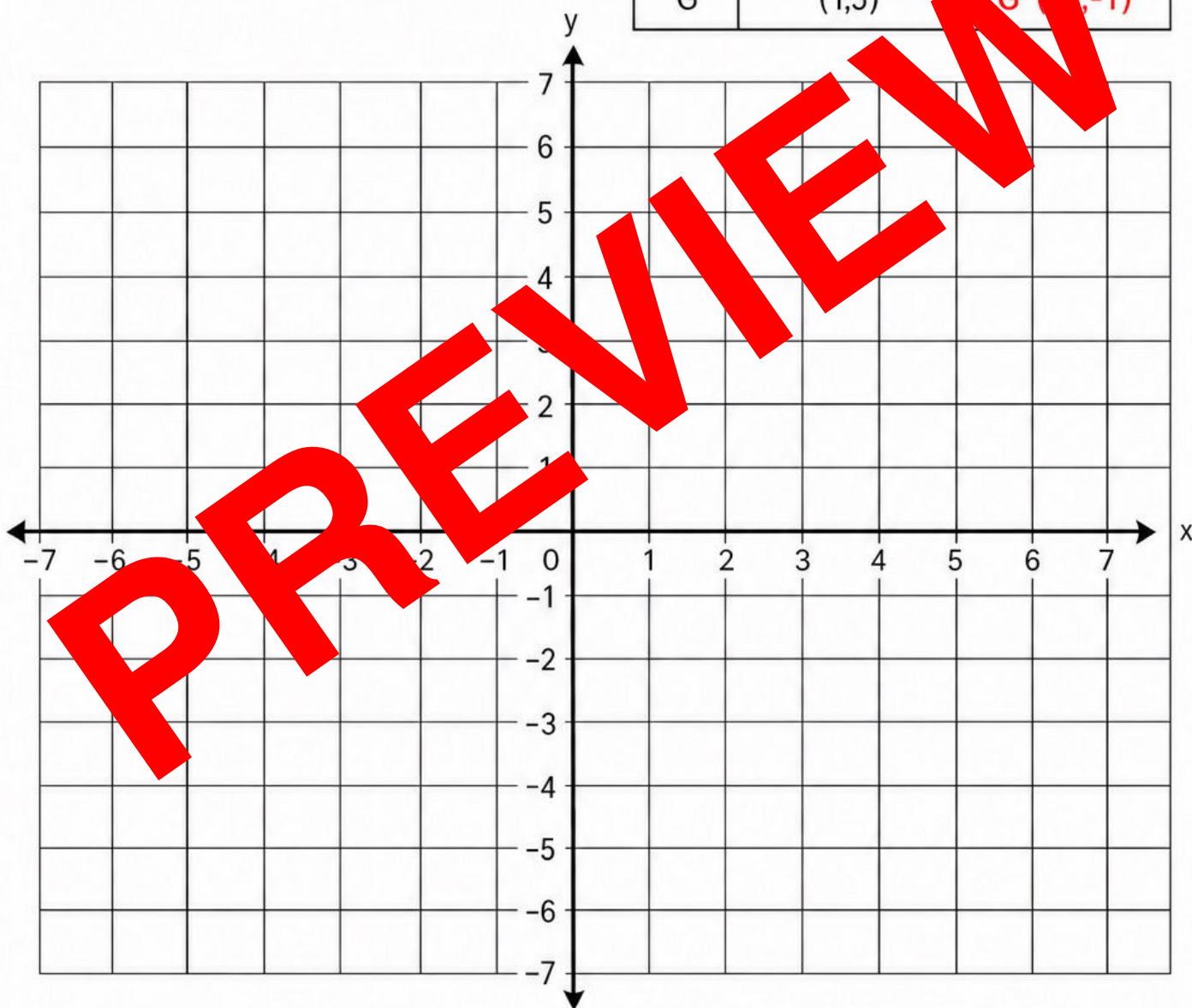
	Original	Image
A	$(-5,-2)$	A' (1,1)
B	$(-2,-2)$	B' (4,1)
C	$(-4,1)$	C' (2,4)

2. Rectangle DEFG: D(1,3), E(4,3), F(4,5), G(1,5).

Translate by vector (-5,-6).

Record D', E', F', G'. Check on the grid.

	Original	Image
D	$(1,3)$	D' (-4,-3)
E	$(4,3)$	E' (-1,-3)
F	$(4,5)$	F' (-1,-1)
G	$(1,5)$	G' (-4,-1)



Write one sentence explaining how you checked the translation.

Every vertex moved the same vector.

REFLECTION COORDINATES

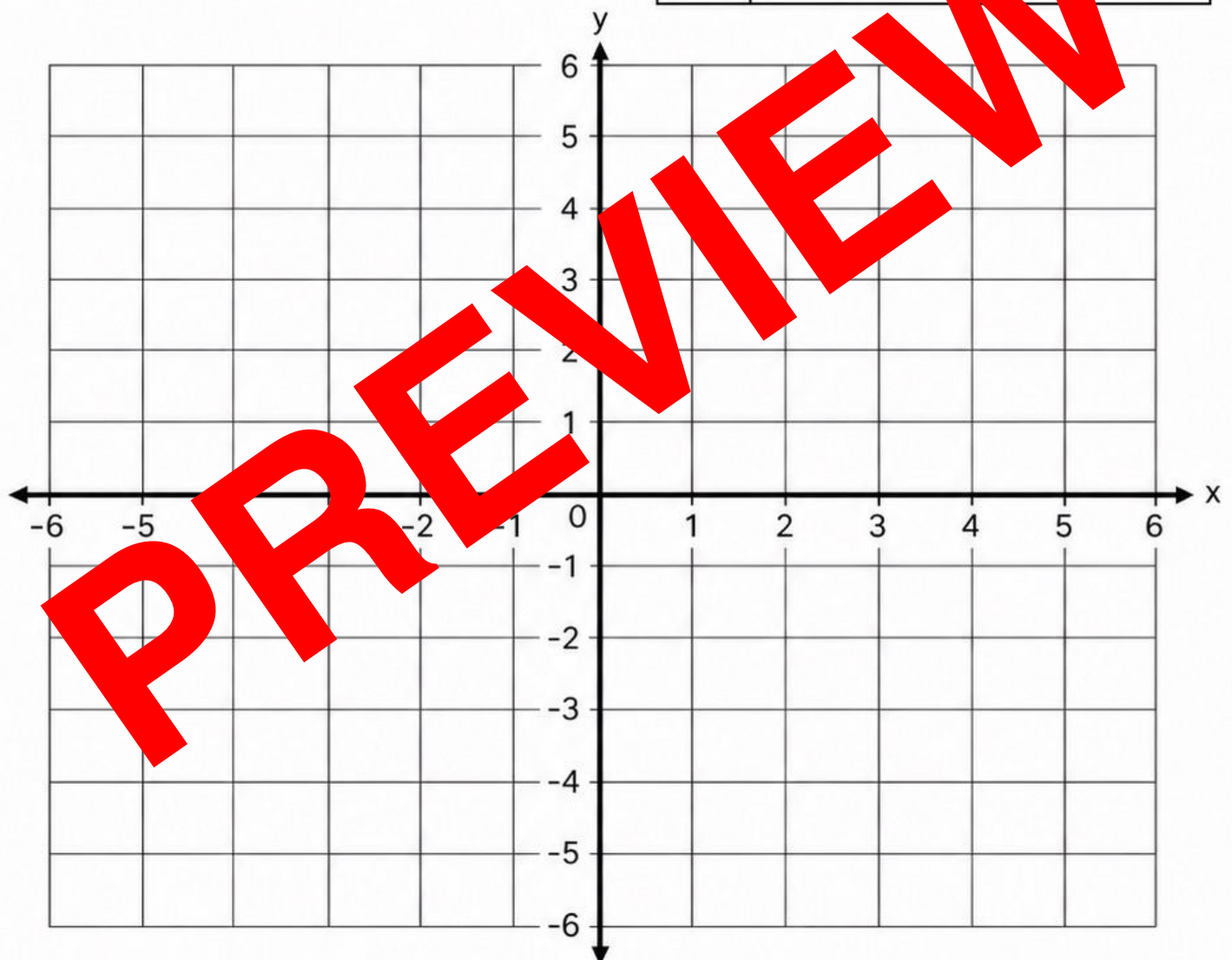
Name: _____

1. Triangle PQR: P(-5,1), Q(-2,1), R(-3,4).
Reflect in the y-axis.

	Original	Image
P	(-5,1)	
Q	(-2,1)	
R	(-3,4)	

2. Trapezium STUV: S(1,-1), T(5,-1),
U(4,-4), V(2,-4). Reflect in the x-axis.

	Original	Image
S	(1,-1)	
T	(5,-1)	
U	(4,-4)	
V	(2,-4)	



Which coordinate changes in Task 1?

Which coordinate changes in Task 2?

REFLECTION COORDINATES

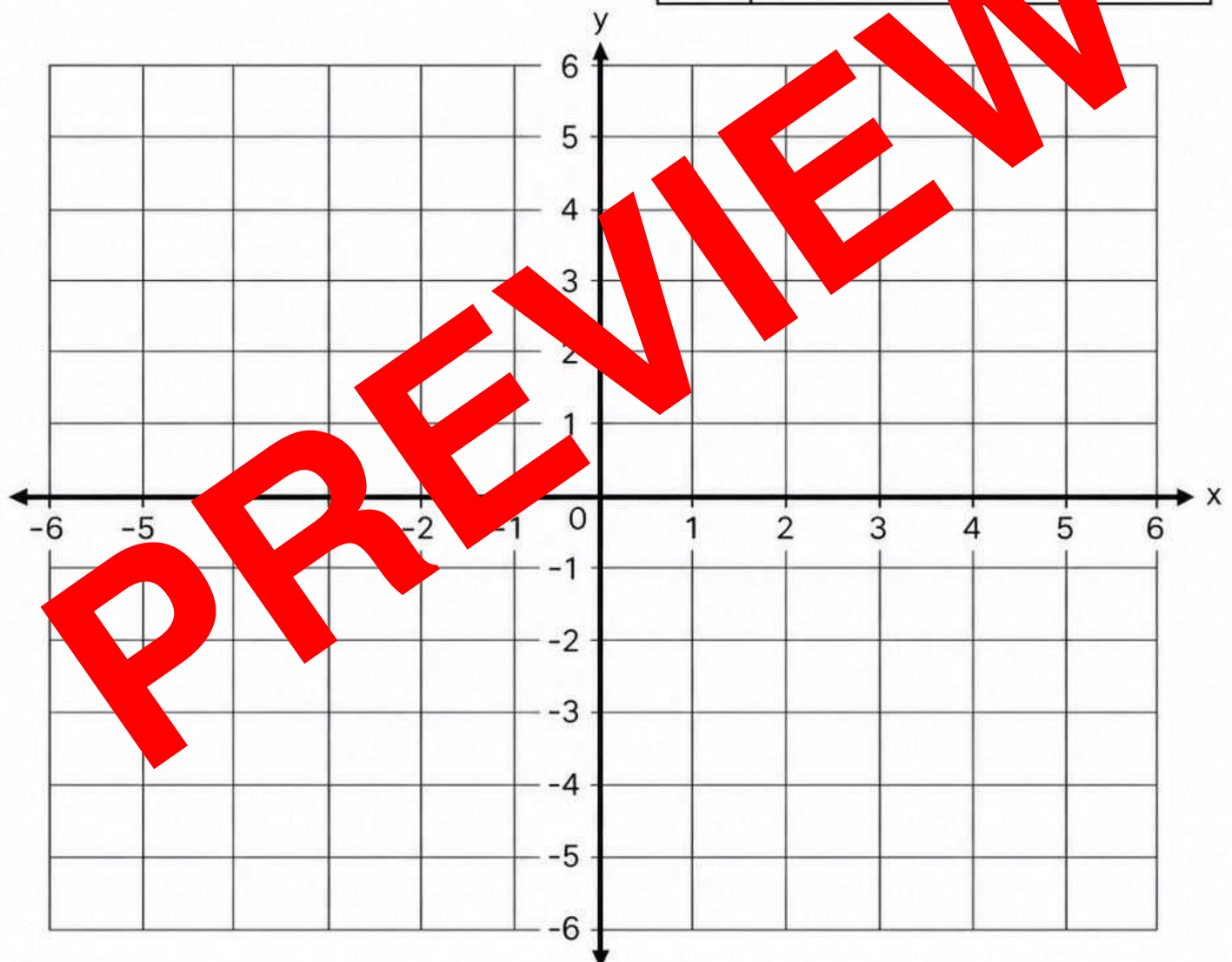
Name: ANSWERS

1. Triangle PQR: P(-5,1), Q(-2,1), R(-3,4).
Reflect in the y-axis.

	Original	Image
P	(-5,1)	P' (5,1)
Q	(-2,1)	Q' (2,1)
R	(-3,4)	R' (3,4)

2. Trapezium STUV: S(1,-1), T(5,-1),
U(4,-4), V(2,-4). Reflect in the x-axis.

	Original	Image
S	(1,-1)	S' (1,1)
T	(5,-1)	T' (5,1)
U	(4,-4)	U' (4,4)
V	(2,-4)	V' (2,4)



Which coordinate changes in Task 1?

The x-coordinate changes sign.

Which coordinate changes in Task 2?

The y-coordinate changes sign.

ROTATION COORDINATES

Name: _____

1. Triangle LMN: L(1,1), M(4,1), N(2,3).

Rotate 90° anticlockwise about the origin.

Record L', M', N'. Check on the grid.

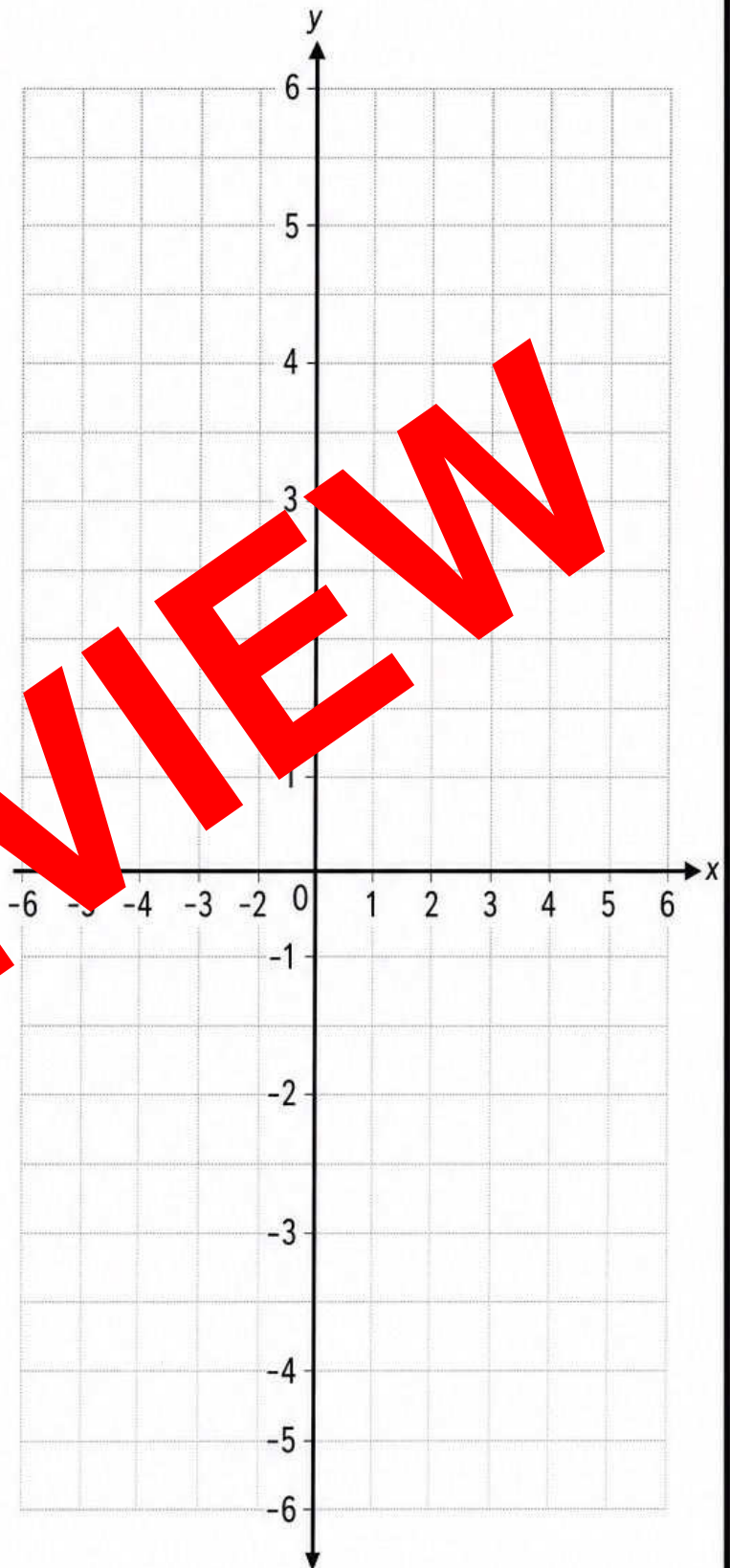
Point	Original	Image
L	(1,1)	
M	(4,1)	
N	(2,3)	

2. Rectangle WXYZ: W(-4,-1), X(-1,-1), Y(-1,-3), Z(-4,-3).

Rotate 180° about the origin.

Record W', X', Y', Z'. Check on the grid.

Point	Original	Image
W	(-4,-1)	
X	(-1,-1)	
Y	(-1,-3)	
Z	(-4,-3)	



Write the coordinate rule used for each task.

Task 1: _____

Task 2: _____

ROTATION COORDINATES

Name: **ANSWERS**

1. Triangle LMN: L(1,1), M(4,1), N(2,3).

Rotate 90° anticlockwise about the origin.

Record L', M', N'. Check on the grid.

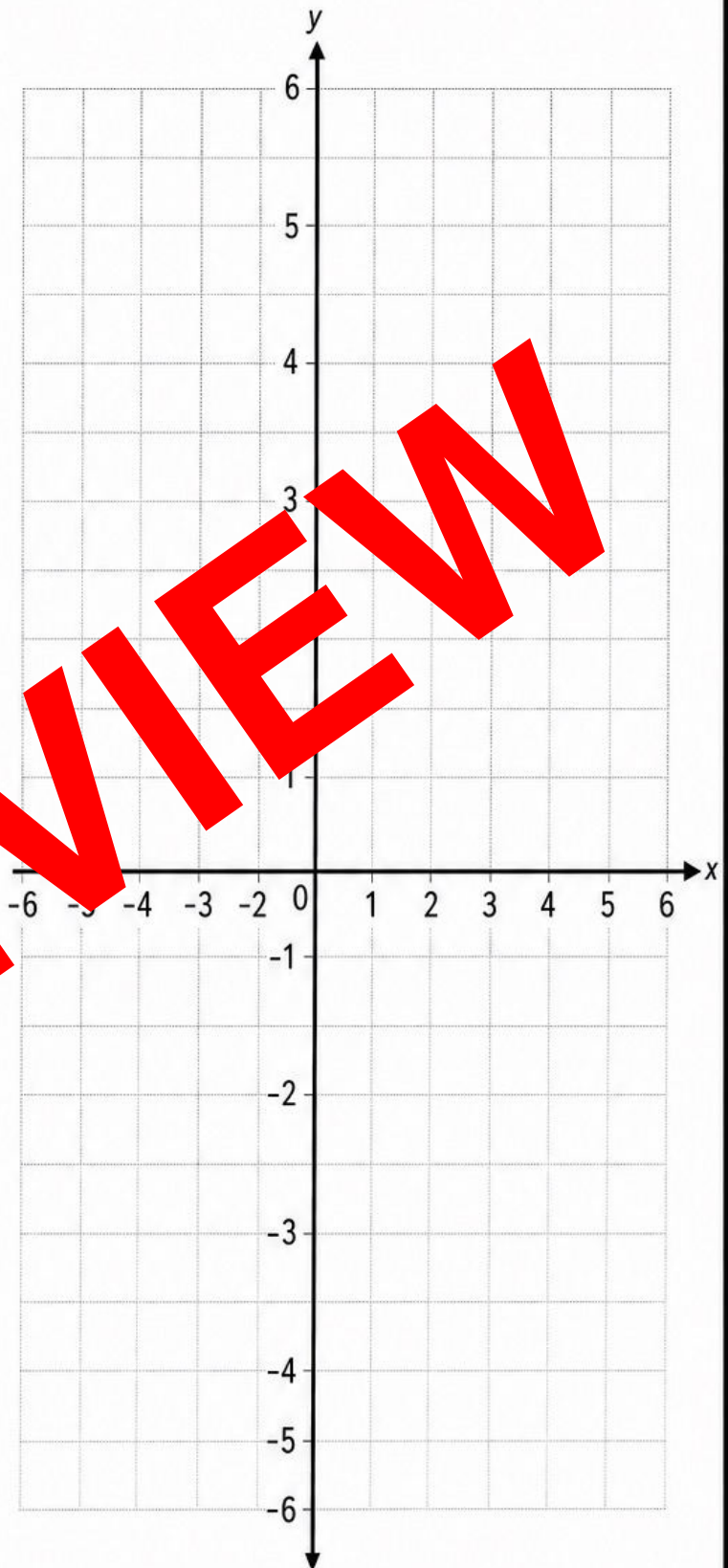
Point	Original	Image
L	(1,1)	L' (-1,1)
M	(4,1)	M' (-1,4)
N	(2,3)	N' (-3,2)

2. Rectangle WXYZ: W(-4,-1), X(-1,-1), Y(-1,-3), Z(-4,-3).

Rotate 180° about the origin.

Record W', X', Y', Z'. Check on the grid.

Point	Original	Image
W	(-4,-1)	W' (4,1)
X	(-1,-1)	X' (1,1)
Y	(-1,-3)	Y' (1,3)
Z	(-4,-3)	Z' (4,3)



Write the coordinate rule used for each task.

Task 1: **90° anticlockwise: $(x, y) \rightarrow (-y, x)$**

Task 2: **180° : $(x, y) \rightarrow (-x, -y)$**

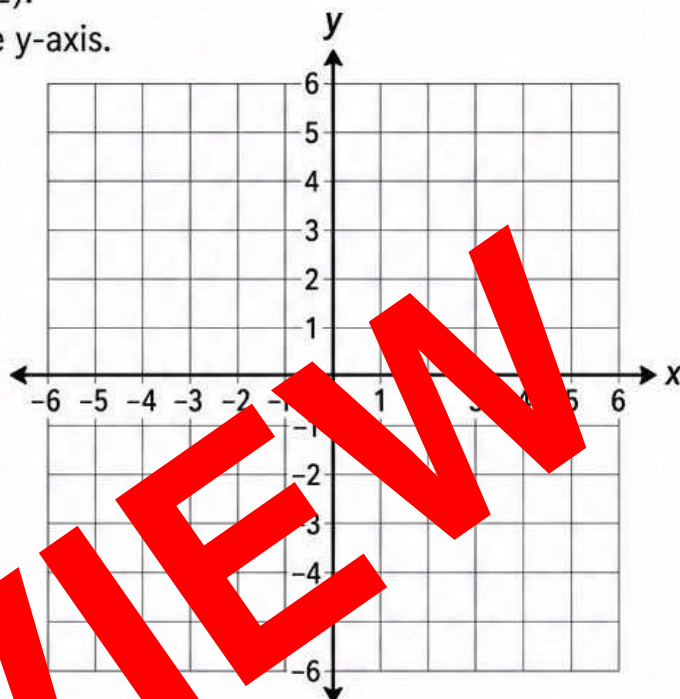
COMBINED TRANSFORMATION SEQUENCES

PAGE 1 - APPLY EACH STEP IN ORDER

Name: _____

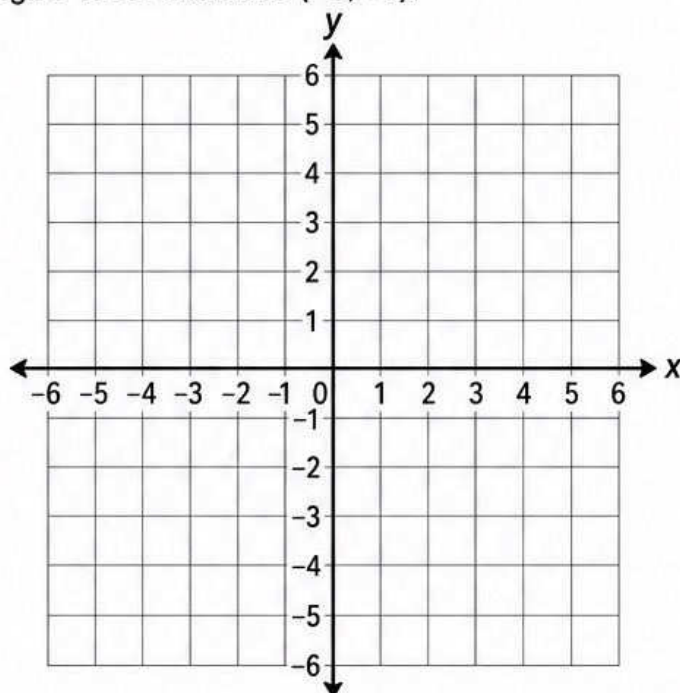
1. Triangle ABC: A(-5, -1), B(-3, -1), C(-4, 2).
First translate (+6, +2). Then reflect in the y-axis.

Point	Original	Image 1	Image 2
A	(-5, -1)		
B	(-3, -1)		
C	(-4, 2)		



2. Rectangle DEFG: D(1, -1), E(4, -4), F(4, -2), G(1, -2).
First rotate 90° anticlockwise about the origin. Then translate (-3, +1).

Point	Original	Image 1	Image 2
D	(1, -1)		
E	(4, -4)		
F	(4, -2)		
G	(1, -2)		



Why must Image 1 be completed before Image 2?

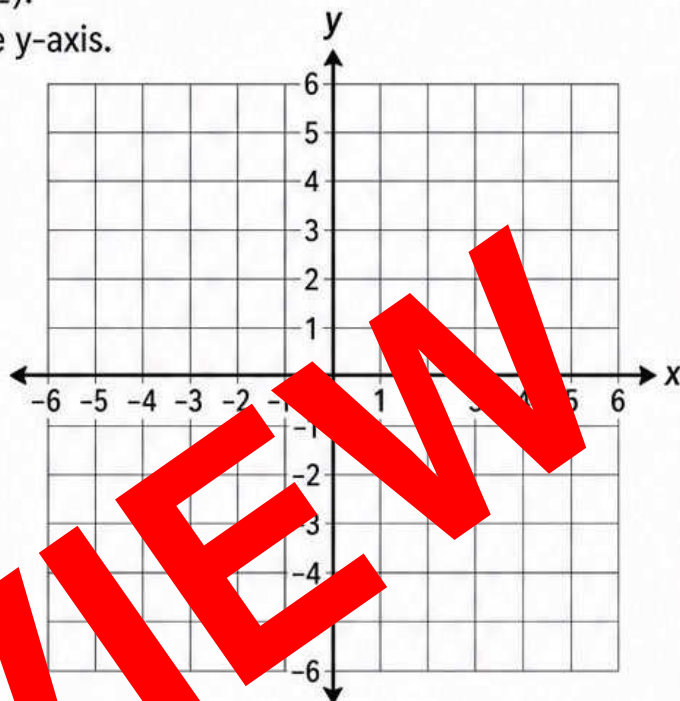
COMBINED TRANSFORMATION SEQUENCES

PAGE 1 - APPLY EACH STEP IN ORDER

Name: ANSWERS

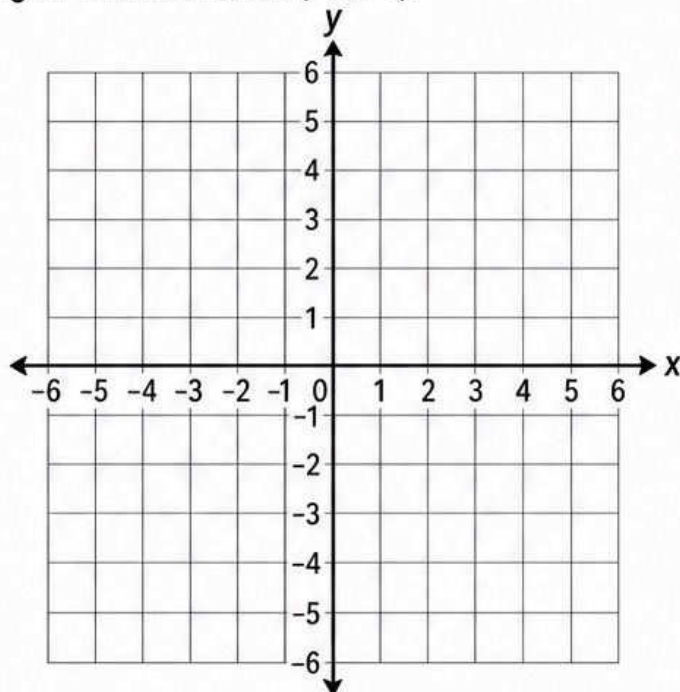
1. Triangle ABC: A(-5,-1), B(-3,-1), C(-4,2).
First translate (+6,+2). Then reflect in the y-axis.

Point	Original	Image 1	Image 2
A	(-5,-1)	A' (1,1)	A" (-1,1)
B	(-3,-1)	B' (3,1)	B" (-3,1)
C	(-4,2)	C' (2,4)	C" (-2,4)



2. Rectangle DEFG: D(1,-4), E(4,-4), F(4,-2), G(1,-2).
First rotate 90° anticlockwise about the origin. Then translate (-3,+1).

Point	Original	Image 1	Image 2
D	(1,-4)	D' (4,1)	D" (1,2)
E	(4,-4)	E' (4,4)	E" (1,5)
F	(4,-2)	F' (2,4)	F" (-1,5)
G	(1,-2)	G' (2,1)	G" (-1,2)



Why must Image 1 be completed before Image 2?

The second rule acts on the first image, not the original.

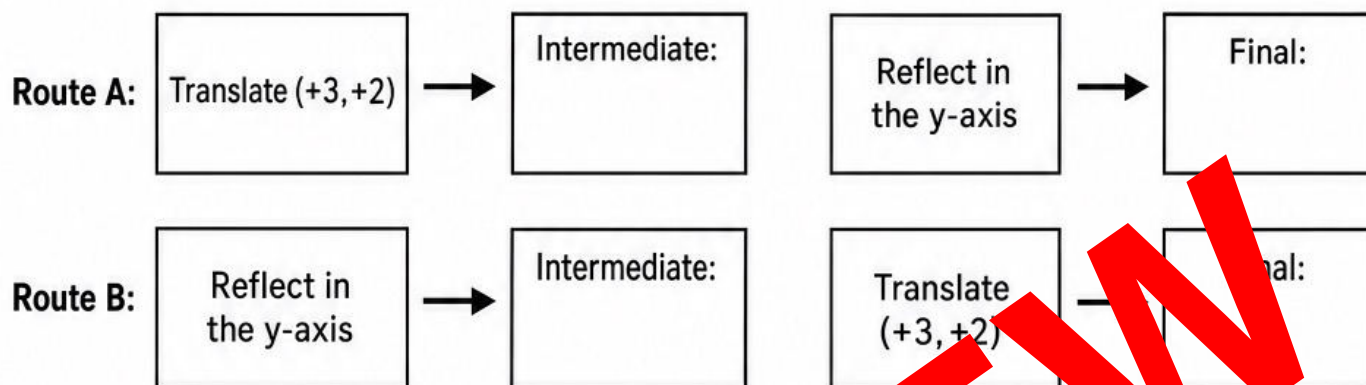
COMBINED TRANSFORMATION SEQUENCES

PAGE 2 - ORDER MATTERS

Name: _____

A. SAME MOVES, DIFFERENT ORDER

Start $P(2,1)$.



Compare the final points. What does this prove?

B. NAME EACH TRANSFORMATION

Point	Original	Image 1	Image 2
A	$(-1, 1)$	$A' (1, -1)$	$A'' (-2, 1)$
B	$(3, 1)$	$B' (1, -3)$	$B'' (-2, -1)$
C	$(2, 3)$	$C' (3, -2)$	$C'' (0, 0)$

Transformation 1: _____

Transformation 2: _____

Point	Original	Image 1	Image 2
P	$(-4, 1)$	$P' (4, 1)$	$P'' (5, -2)$
Q	$(-2, 1)$	$Q' (2, 1)$	$Q'' (3, -2)$
R	$(-3, 3)$	$R' (3, 3)$	$R'' (4, 0)$

Transformation 1: _____

Transformation 2: _____

COMBINED TRANSFORMATION SEQUENCES

PAGE 2 - ORDER MATTERS

Name: ANSWERS

A. SAME MOVES, DIFFERENT ORDER

Start P(2,1).



Compare the final points. What does this prove?

The same transformations in a different order can give a different final position.

B. NAME EACH TRANSFORMATION

Point	Original	Image 1	Image 2
A	(1,1)	A' (1,-1)	A'' (-2,1)
B	(3,1)	B' (1,-3)	B'' (-2,-1)
C	(2,3)	C' (3,-2)	C'' (0,0)

Transformation 1: 90° clockwise rotation about the origin

Transformation 2: translation (-3,+2)

Point	Original	Image 1	Image 2
P	(-4,1)	P' (4,1)	P'' (5,-2)
Q	(-2,1)	Q' (2,1)	Q'' (3,-2)
R	(-3,3)	R' (3,3)	R'' (4,0)

Transformation 1: reflection in the y-axis

Transformation 2: translation (+1,-3)

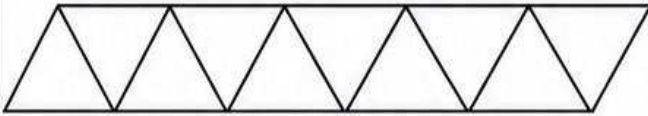
TESSELLATION DETECTIVES

PAGE 1 - TEST THE PATTERN

Name: _____

A tessellation covers a region with no gaps and no overlaps.

A.

☐

Tessellation

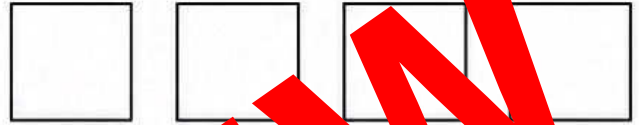
☐

Not a tessellation

Transformation(s): _____

Evidence: _____

B.

☐

Tessellation

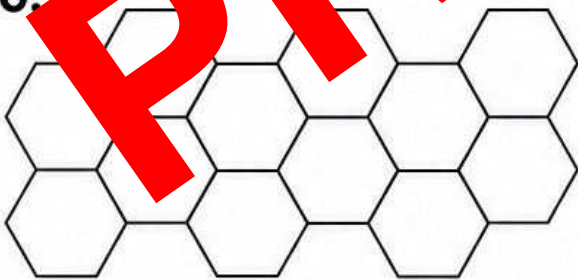
☐

Not a tessellation

Transformation(s): _____

Evidence: _____

C.

☐

Tessellation

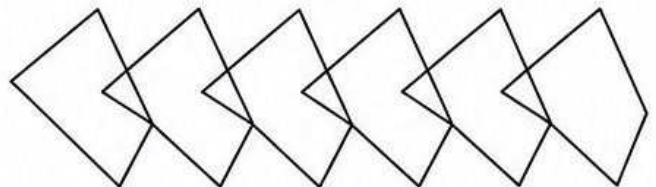
☐

Not a tessellation

Transformation(s): _____

Evidence: _____

D.

☐

Tessellation

☐

Not a tessellation

Transformation(s): _____

Evidence: _____

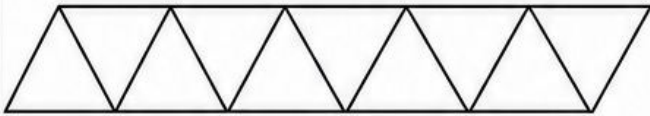
TESSELLATION DETECTIVES

PAGE 1 - TEST THE PATTERN

Name: ANSWERS

A tessellation covers a region with no gaps and no overlaps.

A.



Tessellation

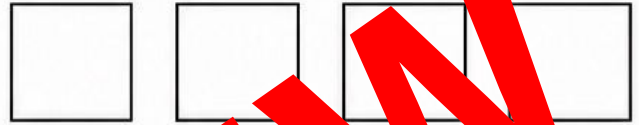


Not a tessellation

Transformation(s): translation and reflection

Evidence: edge-to-edge, no gaps or overlaps

B.



Tessellation

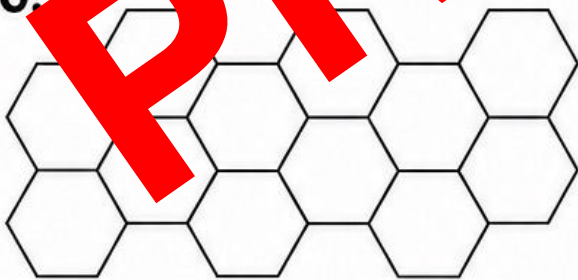


Not a tessellation

Transformation(s): translation

Evidence: gaps remain

C.



Tessellation

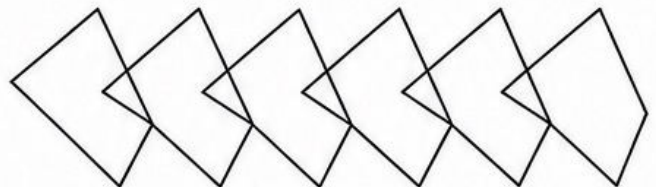


Not a tessellation

Transformation(s): translation

Evidence: hexagons cover the region

D.



Tessellation



Not a tessellation

Transformation(s): translation

Evidence: motifs overlap

TESSELLATION BLUEPRINT

PAGE 2 - CREATE AND EXPLAIN

Name: _____

1. Repeat the motif to cover the grid.
2. Use at least two transformation types.
3. Draw arrows and label each move T, F or R.
4. Check that there are no gaps or overlaps.



My repeat sequence is:

The transformations I used are:

My pattern is a tessellation because:

TESSELLATION BLUEPRINT

PAGE 2 - CREATE AND EXPLAIN

Name: **ANSWERS**

1. Repeat the motif to cover the grid.
2. Use at least two transformation types.
3. Draw arrows and label each move T, F or R.
4. Check that there are no gaps or overlaps.



My repeat sequence is:

- Translate right, reflect, translate right, rotate 180°, repeat.

The transformations I used are:

- translation, reflection and rotation

My pattern is a tessellation because:

- the motifs cover the region with no gaps or overlaps.



TRANSFORMATION TRAIL



1	T
2	F
3	R
4	C
5	T
6	F
7	R
8	C

9	T
10	F
11	R
12	C
13	T
14	F
15	R
16	C

17	T
18	F
19	R
20	C
21	T
22	F
23	R
24	C

25	T
26	F
27	R
28	C
29	T
30	F

RULES

1. Roll and move.
2. Draw a challenge card.
3. Correct: stay.
Incorrect: move back one space.
4. First to FINISH wins.

T	Translation
F	Reflection
R	Rotation
C	Combination

Counters for 2-4 players



TRANSFORMATION TRAIL - CHALLENGE CARDS 1-12

1

T: Translate
(-3,2) by
(+5,-1).

2

F: Reflect
(4,-2) in the
y-axis.

3

R: Rotate
(2,5) 180°
about the origin.

4

F: Reflect
(-1,6) in the
x-axis.

5

R: Rotate
(-3,2) 90°
clockwise.

6

T: Translate
(5,-4) by
(-7,+3).

7

F: Name the
move: same
orientation,
4 right.

8

F: Name the
move: mirror
image across a
vertical line.

9

R: Name the
move: quarter-
turn
anticlockwise.

10

R: True or
false: rotations
change size.

11

T: True or
false: a
translation
changes
orientation.

12

F: Which
transformation
maps (3,1) to
(-3,1)?

TRANSFORMATION TRAIL - CHALLENGE CARDS 13-24

13

F: Reflect $(-5, -3)$
in the x-axis.

14

R: Rotate $(4, -1)$
 90° anticlockwise.

15

T: Translate $(-2, 0)$
by $(+6, +4)$.

16

R: Rotate $(-2, -5)$
 180° about
the origin.

17

F: Give the rule
for reflection
in the x-axis.

18

R: Give the rule
for 90° clockwise
rotation.

19

C: Can regular
polygons
tessellate?

20

C: Can circles
alone tessellate
without gaps?

21

C: Name one
boundary condition
for a tessellation.

22

C: Reflect $(2, 1)$
in the y-axis,
then translate
 $(+3, 0)$.

23

C: Rotate $(1, 3)$
 180° , then
translate $(0, +2)$.

24

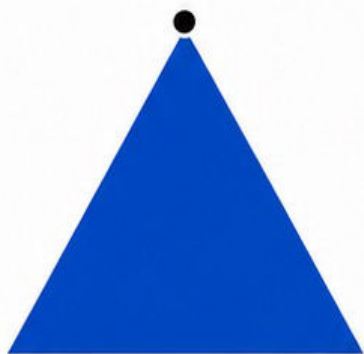
C: Why can
transformation
order matter?

TRANSFORMATION TRAIL - ANSWER KEY

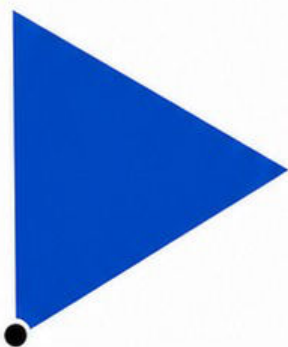
- ★ ————— ★ ————— ★
- | | |
|------------------------------------|--|
| 1 (2,1) | 13 (-5,3) |
| 2 (-4,-2) | 14 (1,4) |
| 3 (-2,-5) | 15 (4,4) |
| 4 (-1,-6) | 16 (2,5) |
| 5 (2,3) | 17 $(x, y) \rightarrow (x, -y)$ |
| 6 (-2,-1) | 18 $(x, y) \rightarrow (y, -x)$ |
| 7 translation | 19 yes |
| 8 reflection | 20 no |
| 9 rotation | 21 no gaps or no overlaps |
| 10 false | 22 (1,1) |
| 11 false | 23 (-1,-1) |
| 12 reflection in the y-axis | 24 the second move acts on the first image, so changing order can change the result |

Accept equivalent precise wording for explanation items.

TESSELLATION BUILDERS - MOTIF TILES



Equilateral triangle



Equilateral triangle



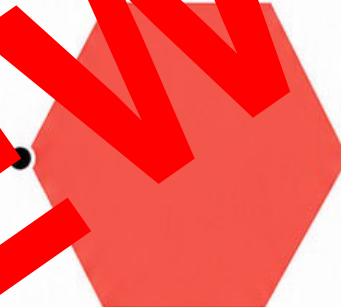
Square



Square



Regular hexagon



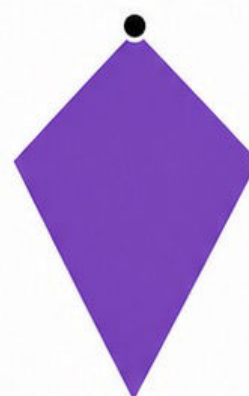
Regular hexagon



Rhombus



Rhombus



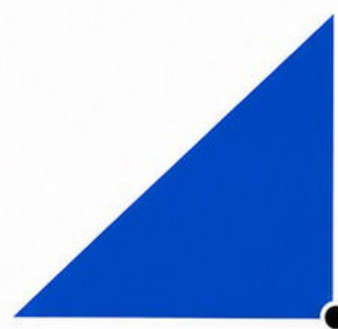
Kite



Kite



Right-angled triangle



Right-angled triangle

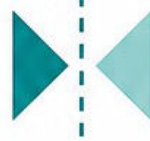
TESSELLATION BUILDERS - CHALLENGES

1



Make a strip using translations only.

2



Make a mirror band using reflection.

3



Create a quarter-turn rosette.

4



Cover a region with one shape and no gaps.

5



Use two shapes in one repeating pattern.

6



Create a motif, then translate it.

7



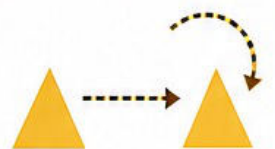
Rotate a motif 180 degrees around a marked point.

8



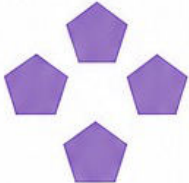
Reflect a motif across a vertical line.

9



Combine a translation and a rotation.

10



Make a non-tessellation and explain the gap.

11



Compare two patterns. Which uses fewer transformations?

12



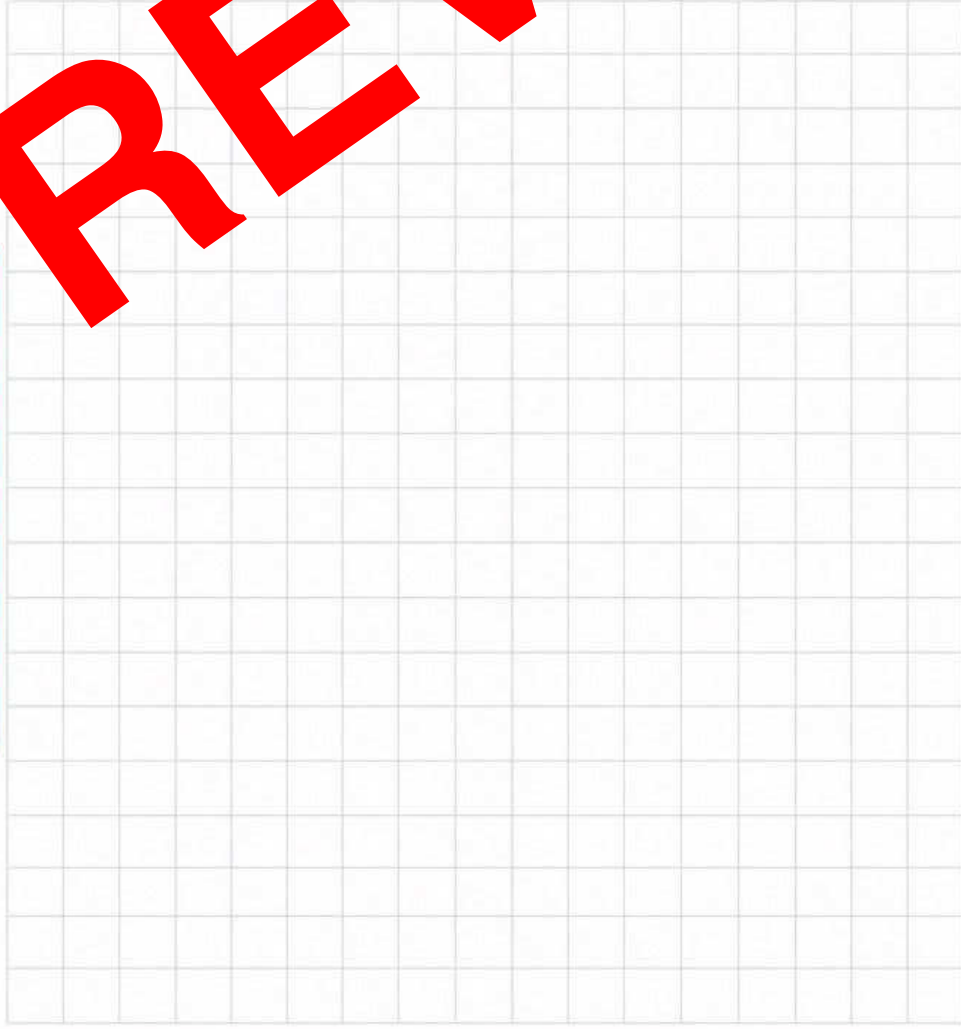
Create a tessellation and label three transformations.

TESSELLATION BUILDERS - PATTERN MAT



Use motif tiles to build a repeating pattern. Label each move T, F or R. Check: no gaps, no overlaps.

SQUARE GRID



TRIANGULAR GRID

☐

motif repeated

☐

transformations labelled

☐

no gaps

☐

no overlaps



PATTERN PAVILION DESIGN CHALLENGE

PAGE 1 - COORDINATE ACCURACY

Name: _____

1. Triangle ABC: A(-5,-2), B(-2,-2), C(-4,1).

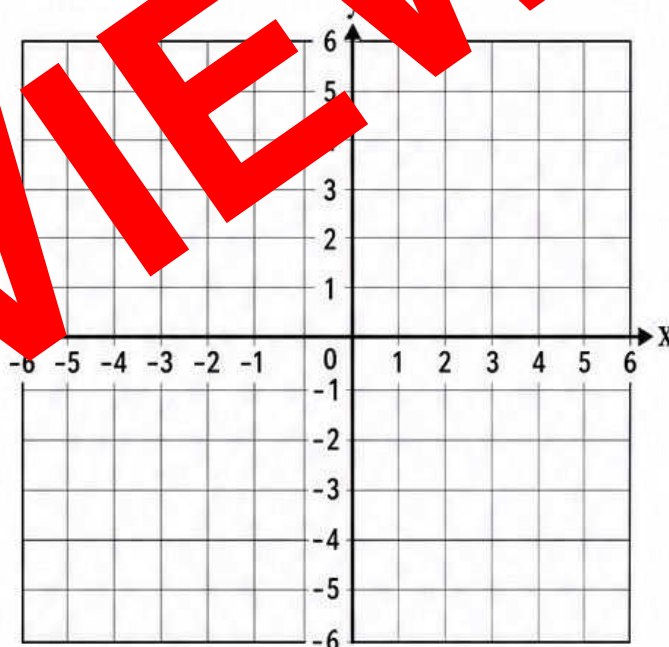
Translate (+6,+3), then reflect in the y-axis.

Point	Original	Image 1	Image 2
A	(-5,-2)		
B	(-2,-2)		
C	(-4,1)		

2. Square DEFG: D(1,1), E(3,1), F(3,3), G(1,3).

Rotate 90° clockwise about the origin,
then translate (-1,+4).

Point	Original	Image 1	Image 2
D	(1,1)		
E	(3,1)		
F	(3,3)		
G	(1,3)		



How did you check each intermediate image?

Why can changing the order change the final image?

PATTERN PAVILION DESIGN CHALLENGE

PAGE 1 - COORDINATE ACCURACY

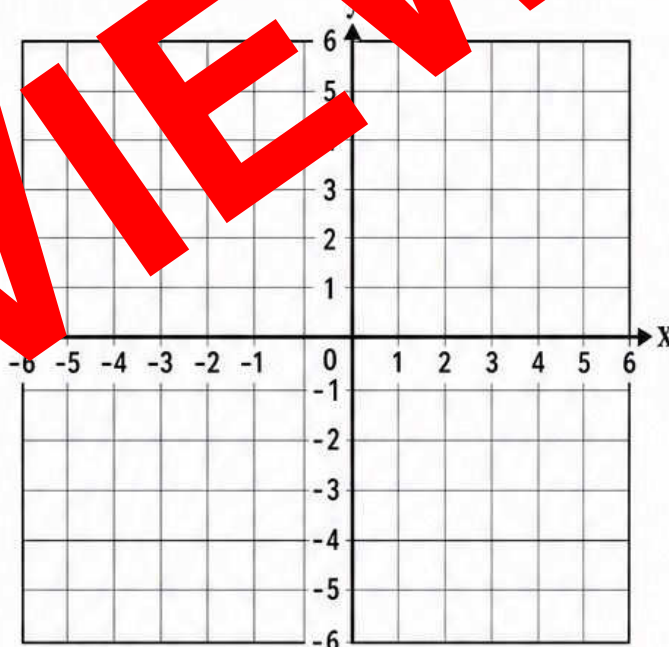
Name: ANSWERS

1. Triangle ABC: A(-5,-2), B(-2,-2), C(-4,1).
Translate (+6,+3), then reflect in the y-axis.

Point	Original	Image 1	Image 2
A	(-5,-2)	A' (1,1)	A'' (-1,1)
B	(-2,-2)	B' (4,1)	B'' (-4,1)
C	(-4,1)	C' (2,4)	C'' (-2,4)

2. Square DEFG: D(1,1), E(3,1), F(3,3), G(1,3).
Rotate 90° clockwise about the origin,
then translate (-1,+4).

Point	Original	Image 1	Image 2
D	(1,1)	D' (1,-1)	D'' (0,3)
E	(3,1)	E' (1,-3)	E'' (0,1)
F	(3,3)	F' (3,-3)	F'' (2,1)
G	(1,3)	G' (3,-1)	G'' (2,3)



How did you check each intermediate image?

I applied and checked one rule at a time for every vertex.

Why can changing the order change the final image?

The second transformation acts on a different first image when the order changes.

PATTERN PAVILION DESIGN CHALLENGE

PAGE 2 - TESSELLATION DESIGN

Name: _____

Context:

Design a floor pattern for a new community pavilion.

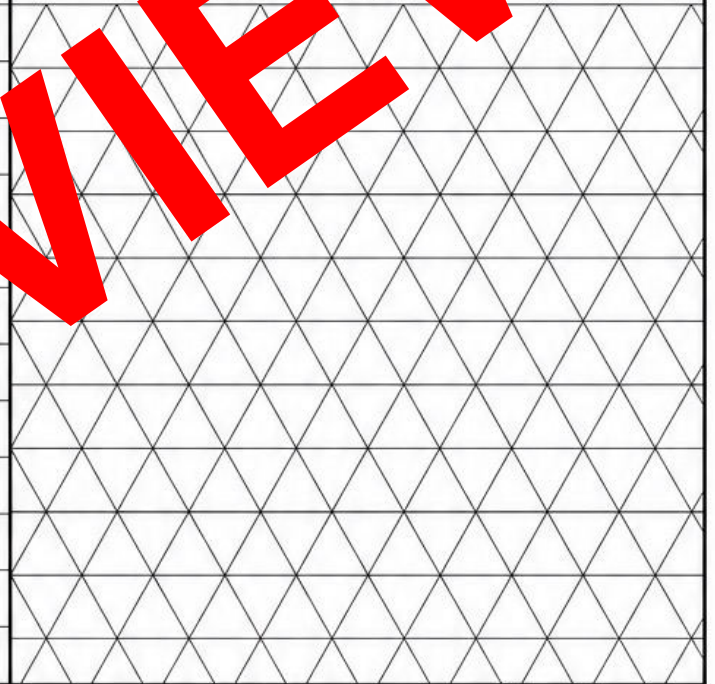
Exact requirements (tick all):

- ☐ Use one clear motif.
- ☐ Use at least two transformation types.
- ☐ Cover the design region with no gaps or overlaps.
- ☐ Label one translation vector, one mirror line or one rotation centre.
- ☐ Describe the repeating sequence.

SQUARE GRID



TRIANGULAR GRID



Motif:

Transformations used:

Repeating sequence:

Evidence that it tessellates:

PATTERN PAVILION DESIGN CHALLENGE

PAGE 2 - TESSELLATION DESIGN

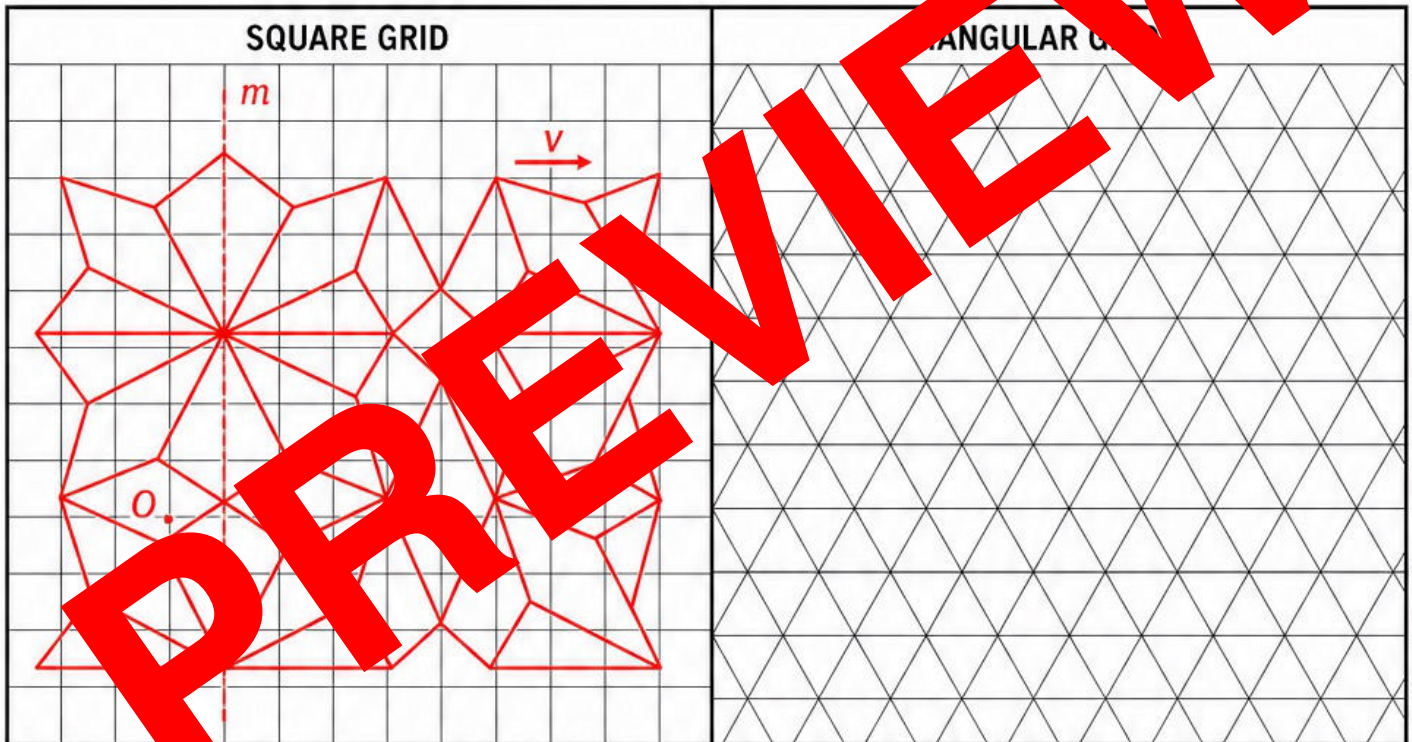
Name: **ANSWERS**

Context:

Design a floor pattern for a new community pavilion.

Exact requirements (tick all):

- ☐ Use one clear motif.
- ☐ Use at least two transformation types.
- ☐ Cover the design region with no gaps or overlaps.
- ☐ Label one translation vector, one mirror line or one rotation centre.
- ☐ Describe the repeating sequence.



Motif:

a pair of congruent kites.

Transformations used:

translation, reflection and 180° rotation.

Repeating sequence:

reflect the kite, rotate the pair 180° , then translate the pair across the row; repeat.

Evidence that it tessellates:

every edge meets another edge and the region has no gaps or overlaps.

UNDERSTANDING TRANSFORMATIONS RUBRIC

CRITERIA	BEGINNING	DEVELOPING	ACHIEVING	CONFIDENT	EXCEEDING
Identifies transformations	Identifies with substantial support.	Identifies common examples.	Accurately identifies translation, reflection and rotation.	Distinguishes varied and combined examples.	Generalises features in unfamiliar patterns.
Applies coordinate rules	Applies rules with substantial support.	Finds some correct image coordinates.	Applies standard coordinate rules accurately.	Uses rules accurately and efficiently.	Analyses and generalises unfamiliar rules.
Combines transformations	Sequence is incomplete.	Records part of a sequence.	Produces correct intermediate and final images.	Explains why order matters.	Compares and evaluates transformation sequences.
Creates a tessellation	Pattern has gaps or overlaps.	Creates a partly repeating pattern.	Creates a valid tessellation using two transformations.	Labels a well-controlled tessellation.	Creates and refines a complex tessellation.
Explains and checks reasoning	Gives a limited explanation.	Gives a basic explanation.	Explains and checks clearly.	Justifies transformations and boundaries.	Communicates rigorous, transferable reasoning.



Understanding Transformations



Understanding Transformations Quiz



Homework without the hassle

Sukindi is an Australian learning platform that supports Teachers, Parents and Students with an interactive homework app and downloadable resources.



Scan to start your
free 7-day trial

www.sukindi.com.au



Prisms and Pyramids Update - Year 6

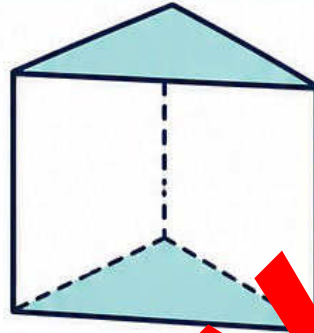
Table of Contents	
Presentation: Prisms and Pyramids Update	
Classroom Display: Prisms and Pyramids at a Glance	
Worksheet 1: Classify the Solids	
Worksheet 2: Right or Oblique?	
Worksheet 3: Stack and Sketch Prisms	
Worksheet 4: Cross-Section Predictions	
Worksheet 5: Prisms and Pyramids in Context	
Worksheet 6: Compare and Explain	
Game 1: Prism Detective Sort	
Game 2: Cross-Section Quest	
Quiz: Prisms and Pyramids Update	
Assessment: Gallery Roof Design Brief	
Rubric: Prisms and Pyramids Update	



PRISMS AND PYRAMIDS AT A GLANCE

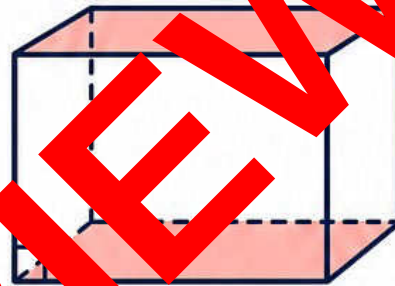
1 PRISM

2 congruent, parallel bases
Side faces are parallelograms



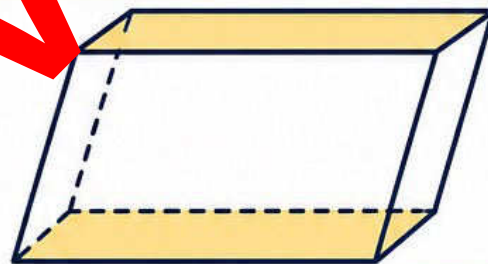
2 RIGHT PRISM

Side edges meet the bases at 90°



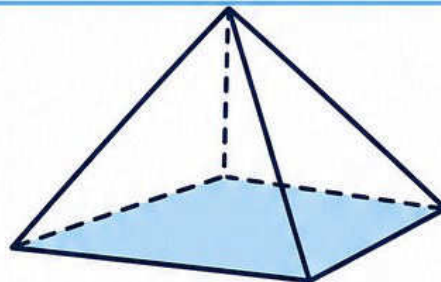
3 OBLIQUE PRISM

Side edges are slanted



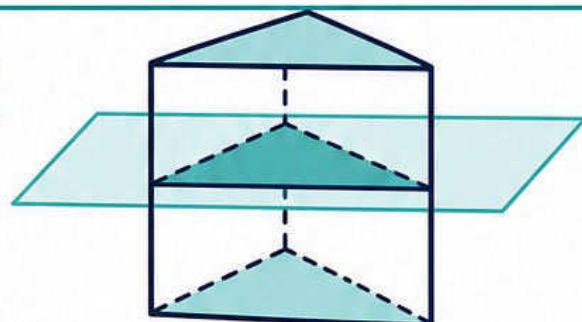
4 PYRAMID

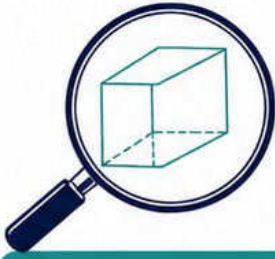
1 polygon base
Triangular faces meet at an apex



5 CROSS-SECTION

A cut parallel to a prism's bases matches the base shape

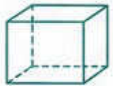




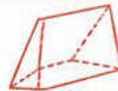
PRISM DETECTIVE SORT

HOW TO PLAY

1. Shuffle the solid cards.
2. Place each card on the matching category.
3. Explain one property that proves your choice.
4. Check the answer guide.



RIGHT PRISM



OBLIQUE PRISM



PYRAMID

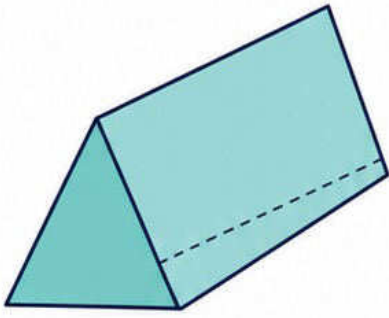


OTHER SOLID

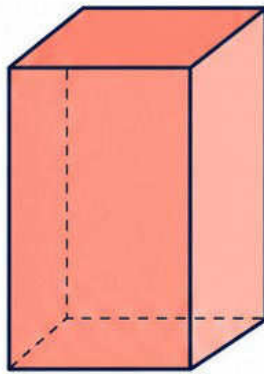
PREVIEW

PRISM DETECTIVE CARDS

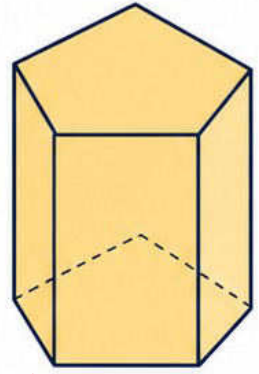
1



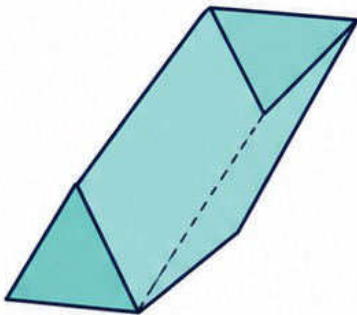
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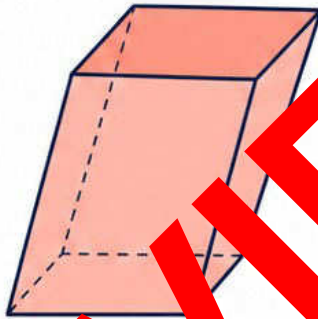
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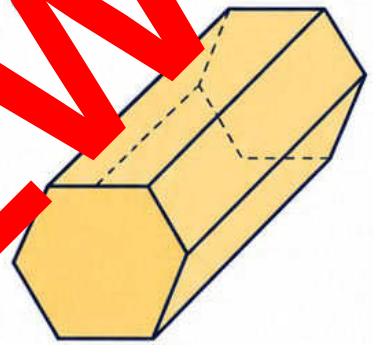
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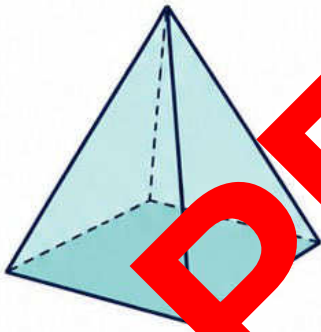
5



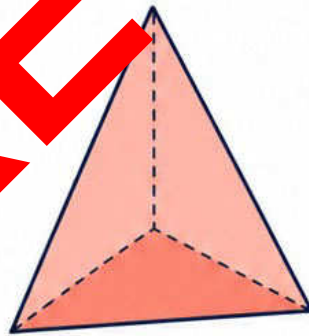
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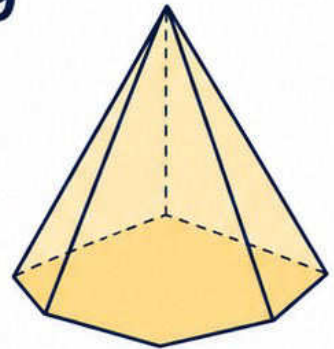
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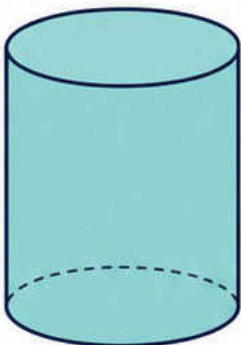
8



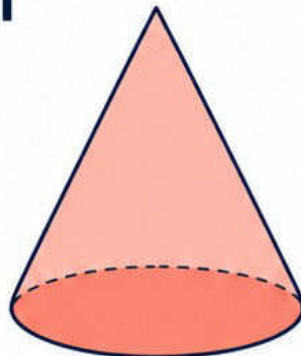
9



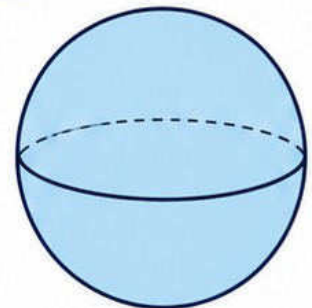
10



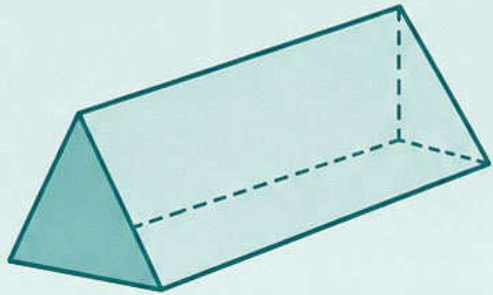
11



12

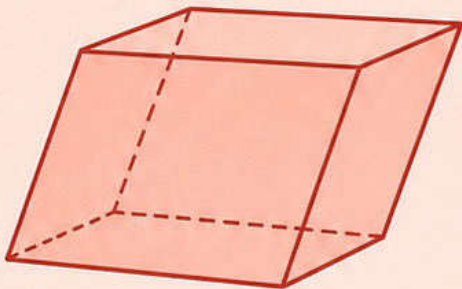


PRISM DETECTIVE ANSWER GUIDE



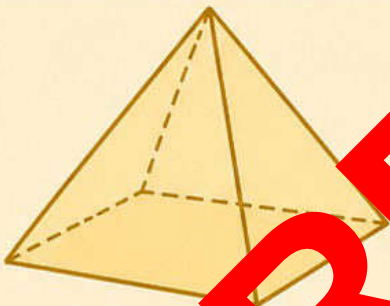
RIGHT PRISM

Cards 1, 2 and 3



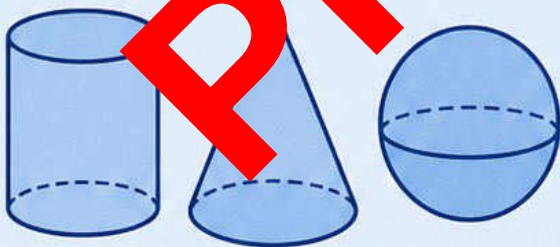
OBLIQUE PRISM

Cards 4, 5 and 6



PYRAMID

Cards 7, 8 and 9



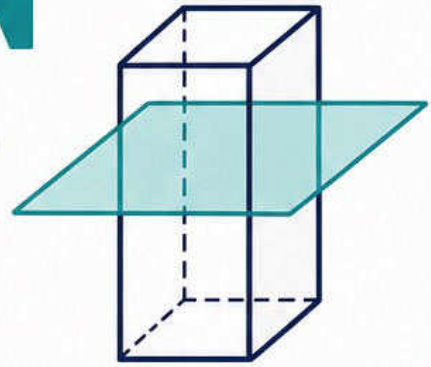
OTHER SOLID

Cards 10, 11 and 12

WHY?

- A prism has two congruent, parallel polygon bases.
- A right prism has side edges perpendicular to its bases.
- A pyramid has one base and triangular faces meeting at an apex.
- A cylinder, cone and sphere are not prisms or pyramids.

CROSS-SECTION QUEST



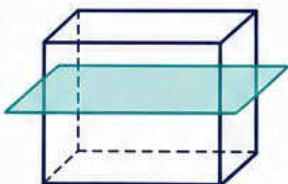
HOW TO PLAY

1. Place counters on START.
2. Draw a challenge card.
3. Sketch or name the cross-section.
4. Move one space for a correct answer.
5. First to FINISH wins.



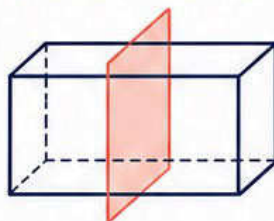
PARALLEL CUT

matches a prism's base



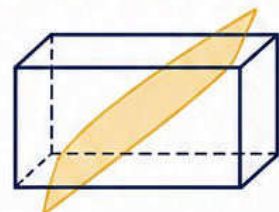
PERPENDICULAR CUT

passes across the solid



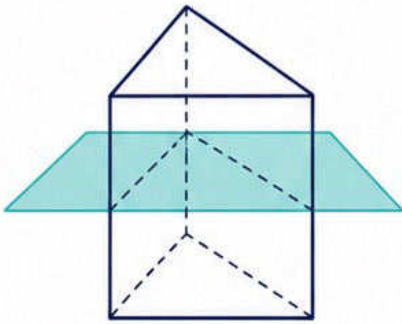
DIAGONAL CUT

passes through at a slant

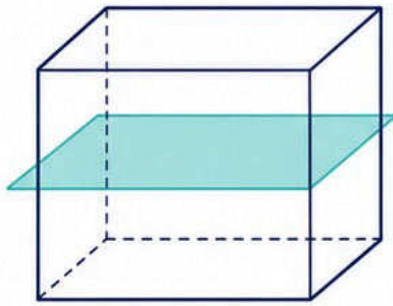


CROSS-SECTION CHALLENGE CARDS

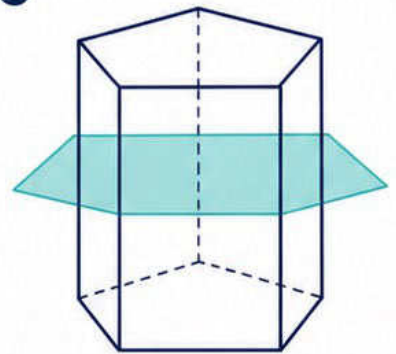
1



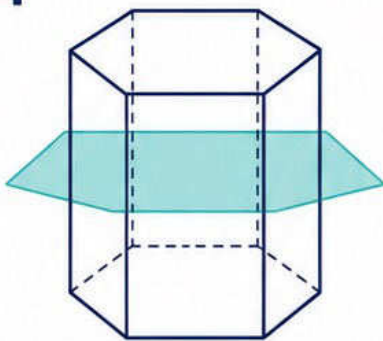
2



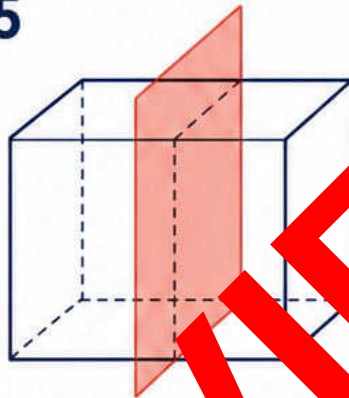
3



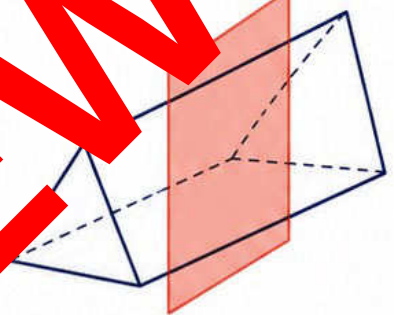
4



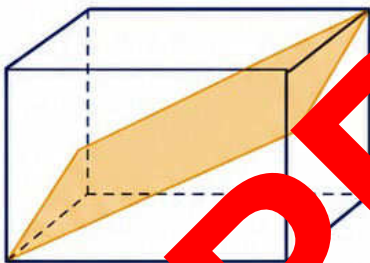
5



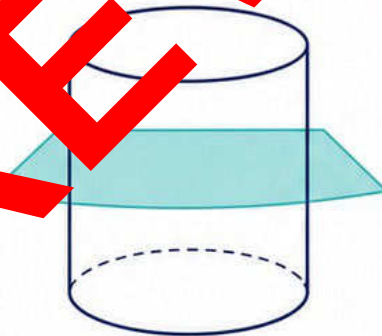
6



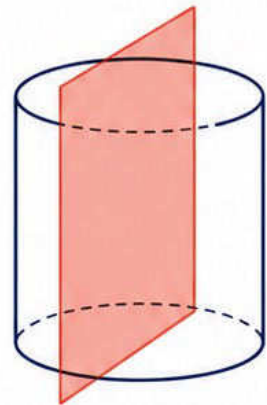
7



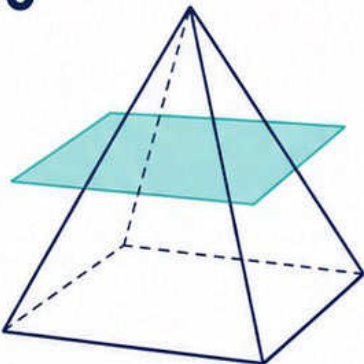
8



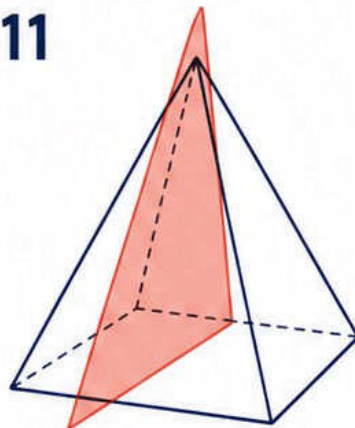
9



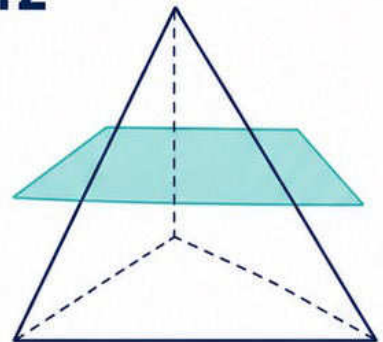
10



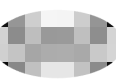
11



12



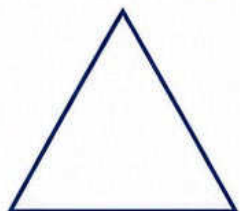
PREVIEW



CROSS-SECTION QUEST ANSWER GUIDE



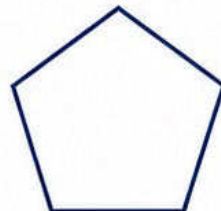
1. Triangle



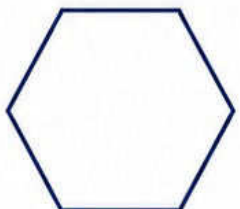
2. Rectangle



3. Pentagon



4. Hexagon



5. Rectangle



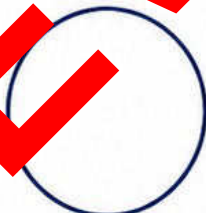
6. Rectangle



7. Rectangle



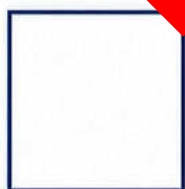
8. Circle



9. Rectangle



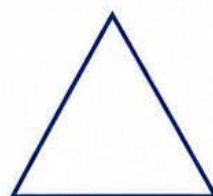
10. Square



11. Triangle



12. Triangle



PARALLEL-CUT INSIGHT

In a prism, a cut parallel to the bases has the same shape as the base.

Name: _____

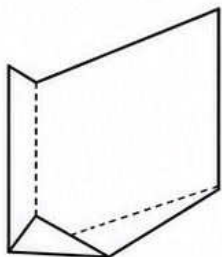
Date: _____

CLASSIFY THE SOLIDS



Classify each solid as a right prism, oblique prism, pyramid or other solid.
Write one property that proves your choice.

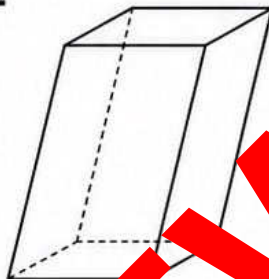
1



Category: _____

Proof: _____

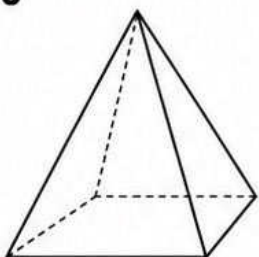
2



Category: _____

Proof: _____

3



Category: _____

Proof: _____

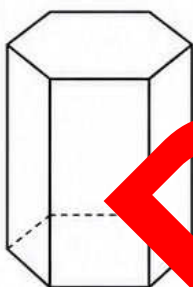
4



Category: _____

Proof: _____

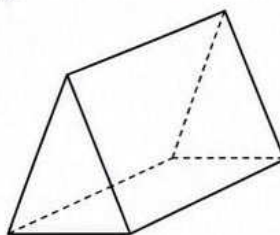
5



Category: _____

Proof: _____

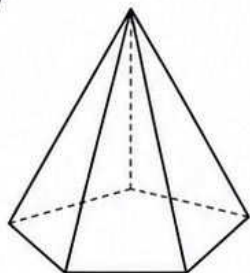
6



Category: _____

Proof: _____

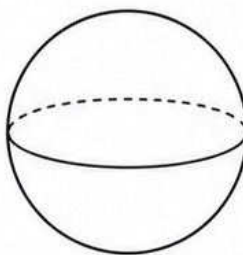
7



Category: _____

Proof: _____

8



Category: _____

Proof: _____

Name: _____

ANSWERS

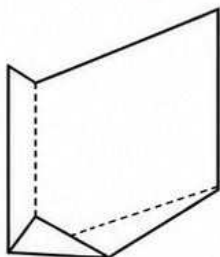
Date: _____

CLASSIFY THE SOLIDS



Classify each solid as a right prism, oblique prism, pyramid or other solid.
Write one property that proves your choice.

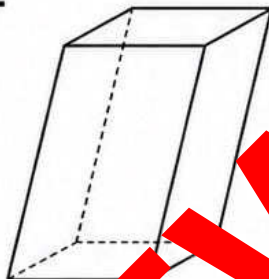
1



Category: Right prism.

Proof: Two congruent parallel triangular bases; side edges meet the bases at right angles.

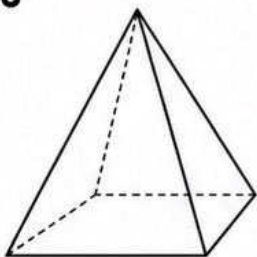
2



Category: Oblique prism.

Proof: Two congruent parallel rectangular bases; side edges slant.

3



Category: Pyramid.

Proof: One square base; four triangular faces meet at one apex.

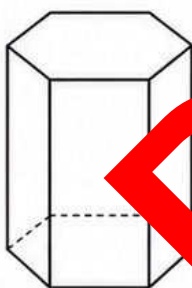
4



Category: Other solid.

Proof: A cylinder has circular bases and a curved surface.

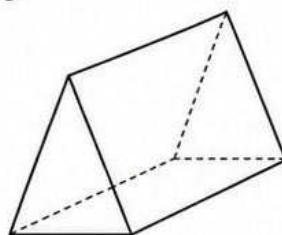
5



Category: Right prism.

Proof: Two congruent parallel hexagonal bases; side edges are perpendicular.

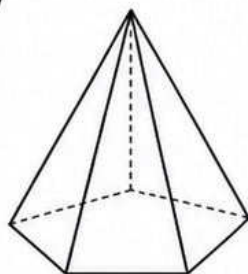
6



Category: Oblique prism.

Proof: Two congruent parallel triangular bases; side edges slant.

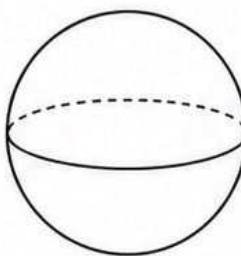
7



Category: Pyramid.

Proof: One pentagonal base; triangular faces meet at one apex.

8



Category: Other solid.

Proof: A sphere has one curved surface and no polygon bases.

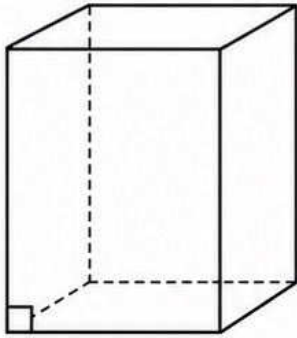
RIGHT OR OBLIQUE?

Name: _____

Date: _____

Decide whether each prism is right or oblique. Mark or explain the feature that proves your decision.

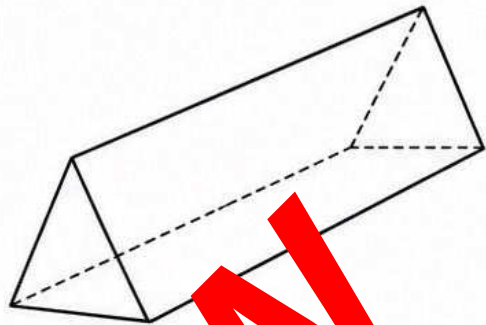
1.



Decision: _____

Evidence: _____

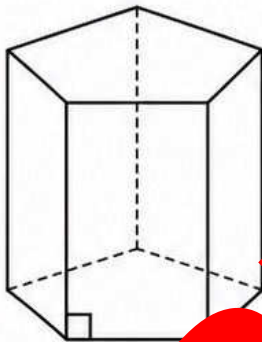
2.



Decision: _____

Evidence: _____

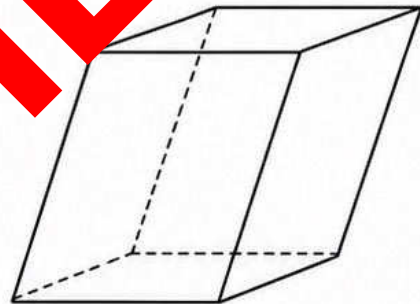
3.



Decision: _____

Evidence: _____

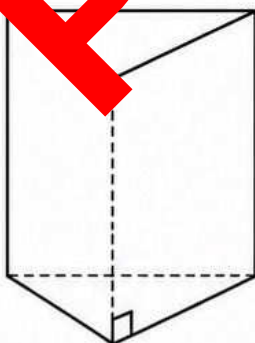
4.



Decision: _____

Evidence: _____

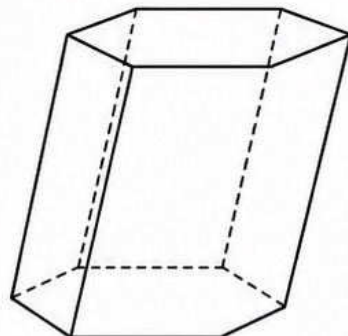
5.



Decision: _____

Evidence: _____

6.



Decision: _____

Evidence: _____



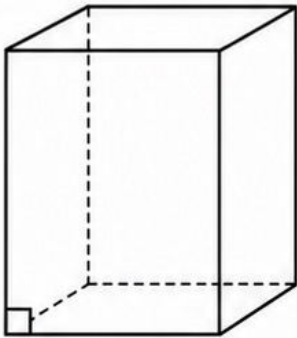
RIGHT OR OBLIQUE?

Name: ANSWERS

Date: _____

Decide whether each prism is right or oblique. Mark or explain the feature that proves your decision.

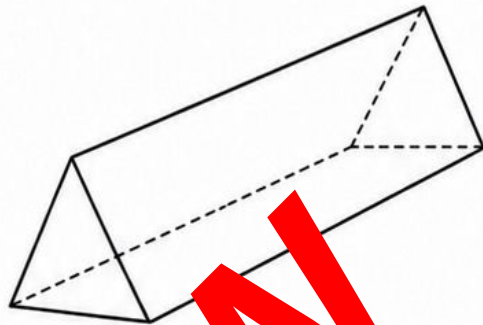
1.



Decision: Right.

Evidence: Side edges are perpendicular to the bases (90°).

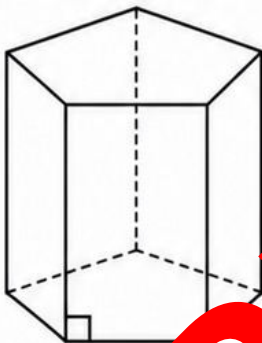
2.



Decision: Oblique.

Evidence: Side edges slant; they are not perpendicular to the bases.

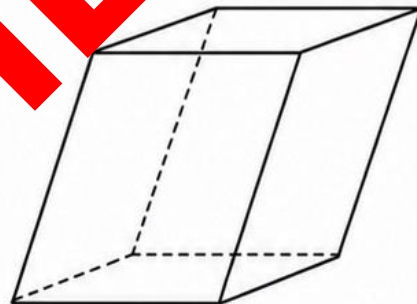
3.



Decision: Right.

Evidence: Side edges are perpendicular to the bases (90°).

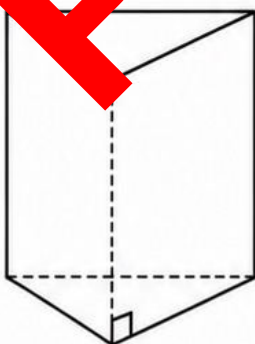
4.



Decision: Oblique.

Evidence: Side edges slant; they are not perpendicular to the bases.

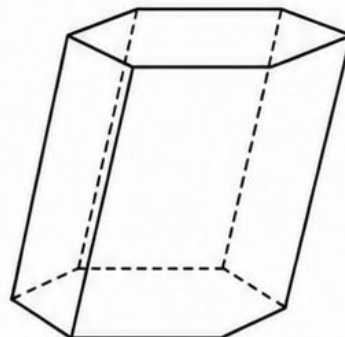
5.



Decision: Right.

Evidence: Side edges are perpendicular to the bases (90°).

6.



Decision: Oblique.

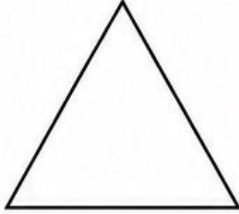
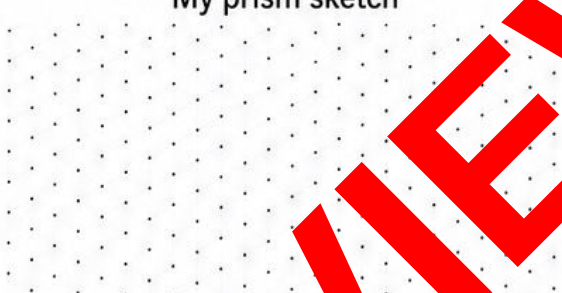
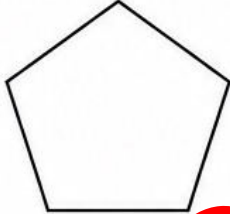
Evidence: Side edges slant; they are not perpendicular to the bases.

STACK AND SKETCH PRISMS

Name: _____

Date: _____

Imagine stacking congruent copies of each base shape straight upward.
Sketch the prism, then complete its properties.

1 Triangle 	My prism sketch 	Bases: _____ Side faces: _____ Edges: _____ Vertices: _____
2 Quadrilateral 	My prism sketch 	Bases: _____ Side faces: _____ Edges: _____ Vertices: _____
3 Pentagon 	My prism sketch 	Bases: _____ Side faces: _____ Edges: _____ Vertices: _____
4 Hexagon 	My prism sketch 	Bases: _____ Side faces: _____ Edges: _____ Vertices: _____

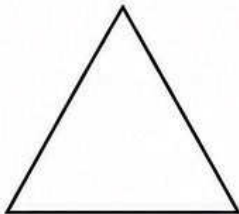
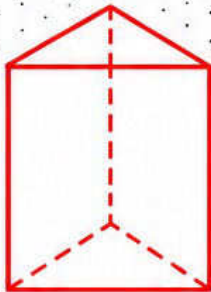
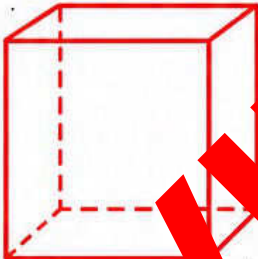
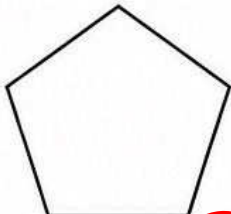
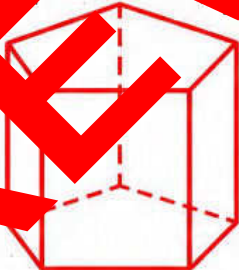
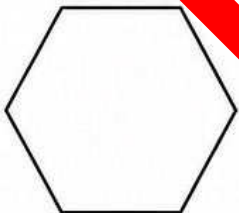
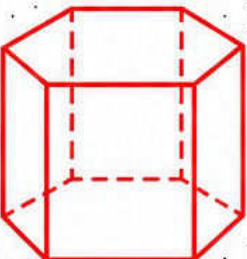
What pattern links the number of sides on the base to the faces, edges and vertices of the prism?

STACK AND SKETCH PRISMS

Name: **ANSWERS**

Date: _____

Imagine stacking congruent copies of each base shape straight upward.
Sketch the prism, then complete its properties.

1 Triangle 	My prism sketch 	Bases: 2 Side faces: 3 Edges: 9 Vertices: 6
2 Quadrilateral 	My prism sketch 	Bases: 2 Side faces: 4 Edges: 12 Vertices: 8
3 Pentagon 	My prism sketch 	Bases: 2 Side faces: 5 Edges: 15 Vertices: 10
4 Hexagon 	My prism sketch 	Bases: 2 Side faces: 6 Edges: 18 Vertices: 12

What pattern links the number of sides on the base to the faces, edges and vertices of the prism?

For an n-sided base: faces = $n + 2$, edges = $3n$ and vertices = $2n$. Every prism has 2 congruent, parallel bases.

CROSS-SECTION PREDICTIONS

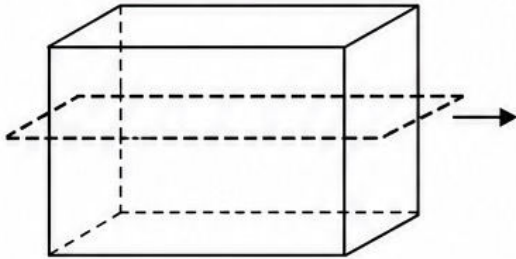
Name: _____

Date: _____

For each solid, imagine the shaded cutting plane. Draw and name the 2D cross-section, then justify your prediction.

1

Rectangular prism cut parallel to its rectangular base.

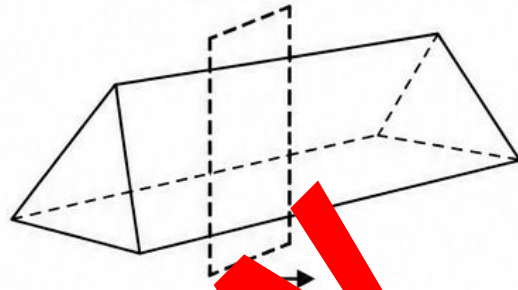


Cross-section: _____

Why: _____

2

Triangular prism cut perpendicular to its triangular bases.

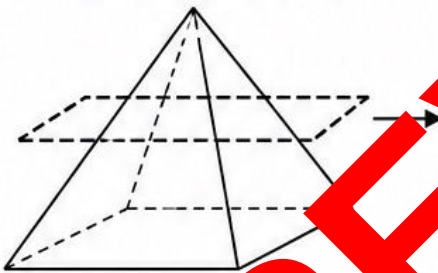


Cross-section: _____

Why: _____

3

Square pyramid cut parallel to its square base, halfway up.

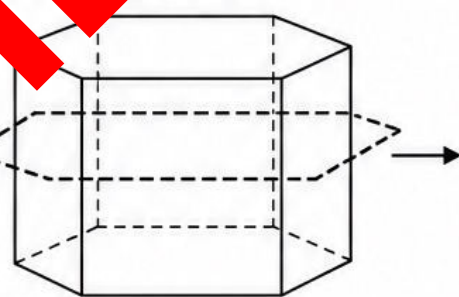


Cross-section: _____

Why: _____

4

Hexagonal prism cut parallel to its hexagonal base.

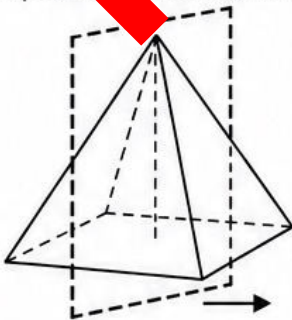


Cross-section: _____

Why: _____

5

Square pyramid cut vertically through the apex and the centre of the base.

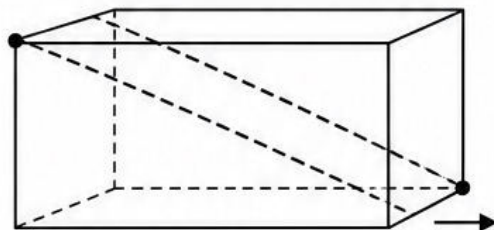


Cross-section: _____

Why: _____

6

Rectangular prism cut diagonally from one top edge to the opposite bottom edge to produce a rectangular cross-section.



Cross-section: _____

Why: _____

CROSS-SECTION PREDICTIONS

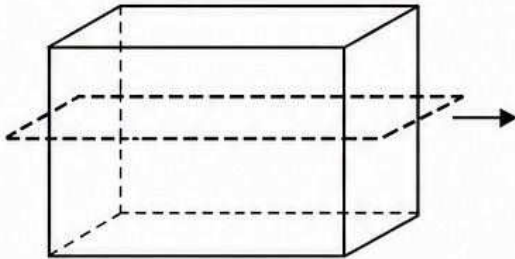
Name: ANSWERS

Date: _____

For each solid, imagine the shaded cutting plane. Draw and name the 2D cross-section, then justify your prediction.

1

Rectangular prism cut parallel to its rectangular base.

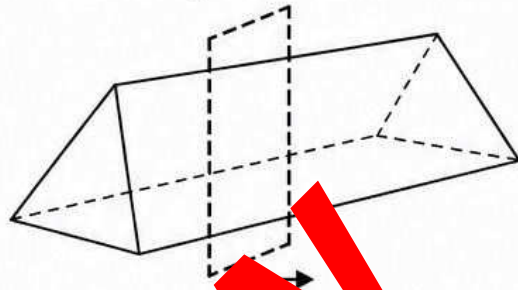


Cross-section: Rectangle.

Why: A cut parallel to a prism's base matches the rectangular base.

2

Triangular prism cut perpendicular to its triangular bases.

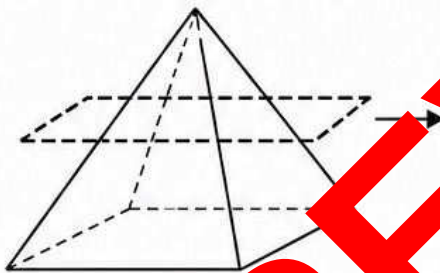


Cross-section: Rectangle.

Why: The perpendicular plane crosses two parallel rectangular side faces.

3

Square pyramid cut parallel to its square base, halfway up.

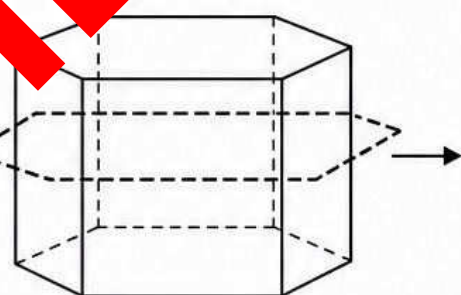


Cross-section: Square.

Why: A plane parallel to a square base makes a smaller similar square.

4

Hexagonal prism cut parallel to its hexagonal base.

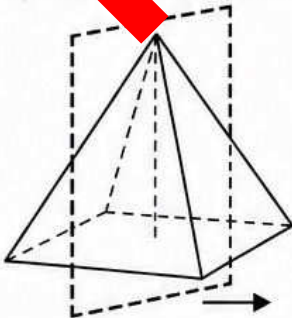


Cross-section: Hexagon.

Why: A cut parallel to a prism's base matches the hexagonal base.

5

Square pyramid cut vertically through the apex and the centre of the base.

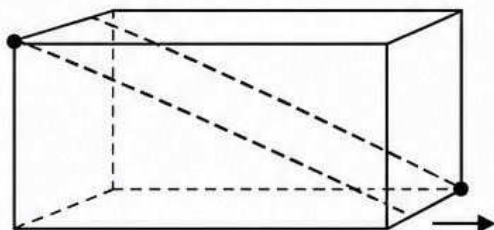


Cross-section: Triangle.

Why: The vertical plane passes through the apex and a line across the base.

6

Rectangular prism cut diagonally from one top edge to the opposite bottom edge to produce a rectangular cross-section.



Cross-section: Rectangle.

Why: The diagonal plane crosses opposite parallel edges and spans the prism.

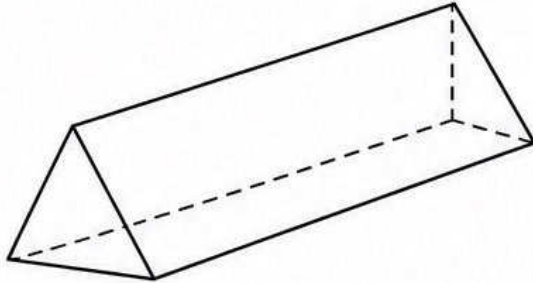
PRISMS AND PYRAMIDS IN CONTEXT

Name: _____

Date: _____

Classify each design. Name the solid or category, then use a defining property as evidence.

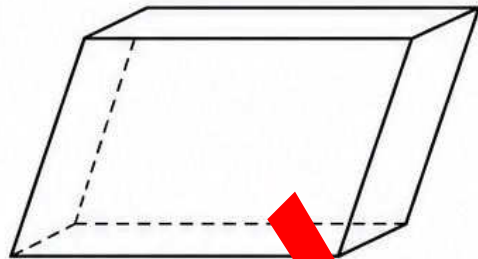
1. Glass walkway



Classification: _____

Evidence: _____

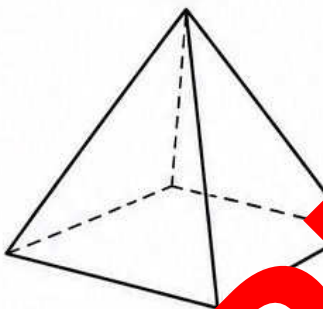
2. Leaning display block



Classification: _____

Evidence: _____

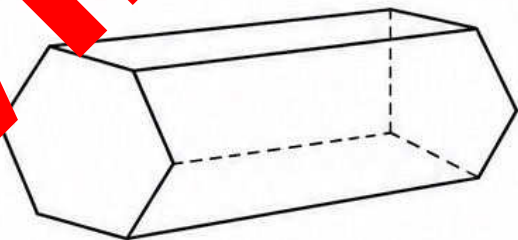
3. Skylight



Classification: _____

Evidence: _____

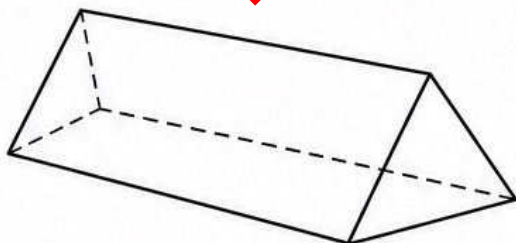
4. Pencil case



Classification: _____

Evidence: _____

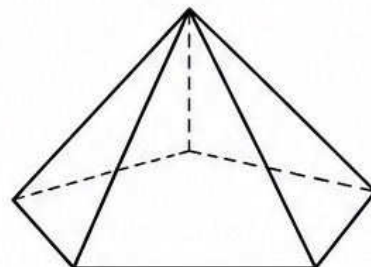
5. Festival tent



Classification: _____

Evidence: _____

6. Garden lantern



Classification: _____

Evidence: _____

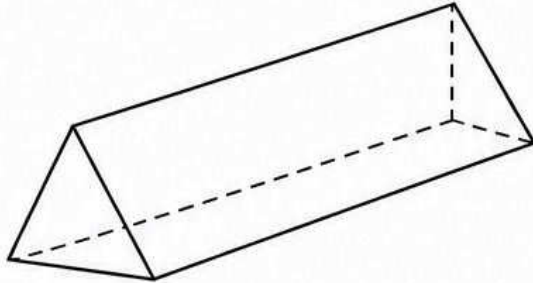
PRISMS AND PYRAMIDS IN CONTEXT

Name: ANSWERS

Date: _____

Classify each design. Name the solid or category, then use a defining property as evidence.

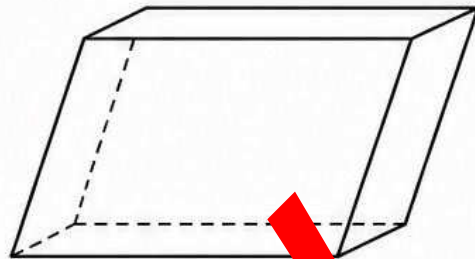
1. Glass walkway



Classification: Right triangular prism.

Evidence: Two congruent parallel triangular ends; connecting edges are perpendicular.

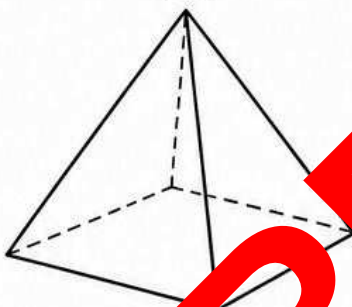
2. Leaning display block



Classification: Oblique rectangular prism.

Evidence: Two congruent parallel rectangular ends; connecting edges slant.

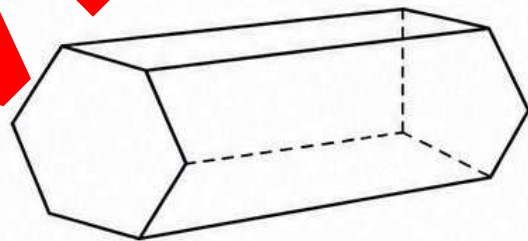
3. Skylight



Classification: Square-based pyramid.

Evidence: One square base; four triangular faces meet at one apex.

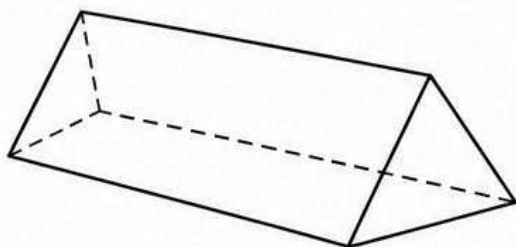
4. Pencil case



Classification: Right hexagonal prism.

Evidence: Two congruent parallel hexagonal ends; connecting edges are perpendicular.

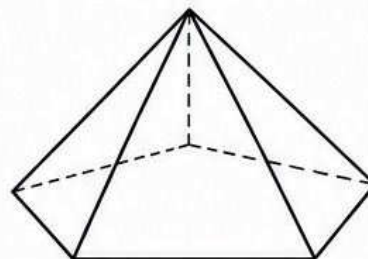
5. Festival tent



Classification: Right triangular prism.

Evidence: Two congruent parallel triangular ends; connecting edges are perpendicular.

6. Garden lantern



Classification: Pentagonal-based pyramid.

Evidence: One pentagonal base; five triangular faces meet at one apex.

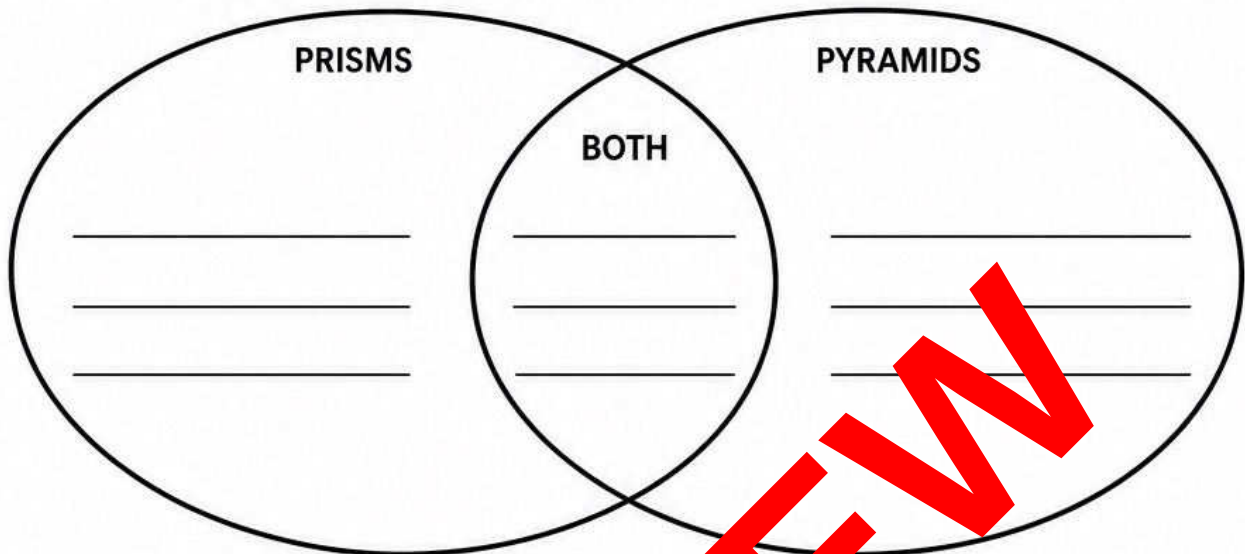
COMPARE AND EXPLAIN

Name: _____

Date: _____

A. Prism or pyramid?

Record defining properties in the correct region.



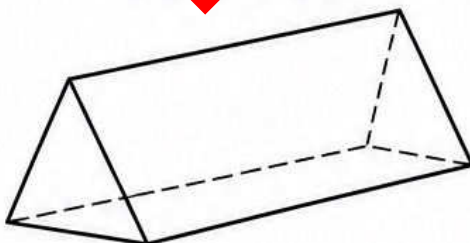
B. True, false or fix it

- Every prism has two congruent, parallel bases. True ☐ False ☐ _____
- Every pyramid has rectangular side faces. True ☐ False ☐ _____
- A right prism has side edges perpendicular to its bases. True ☐ False ☐ _____
- Every cross-section of a prism matches its base. True ☐ False ☐ _____
- A pyramid has one polygonal base. True ☐ False ☐ _____
- An oblique prism is not a prism. True ☐ False ☐ _____

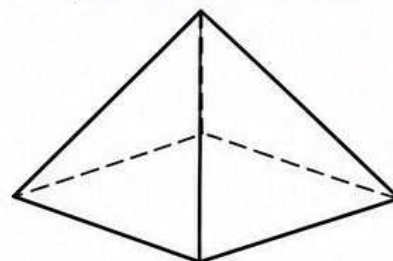
C. Compare the solids

Compare their faces, edges and vertices. Explain one similarity and two differences.

TRIANGULAR PRISM



SQUARE-BASED PYRAMID



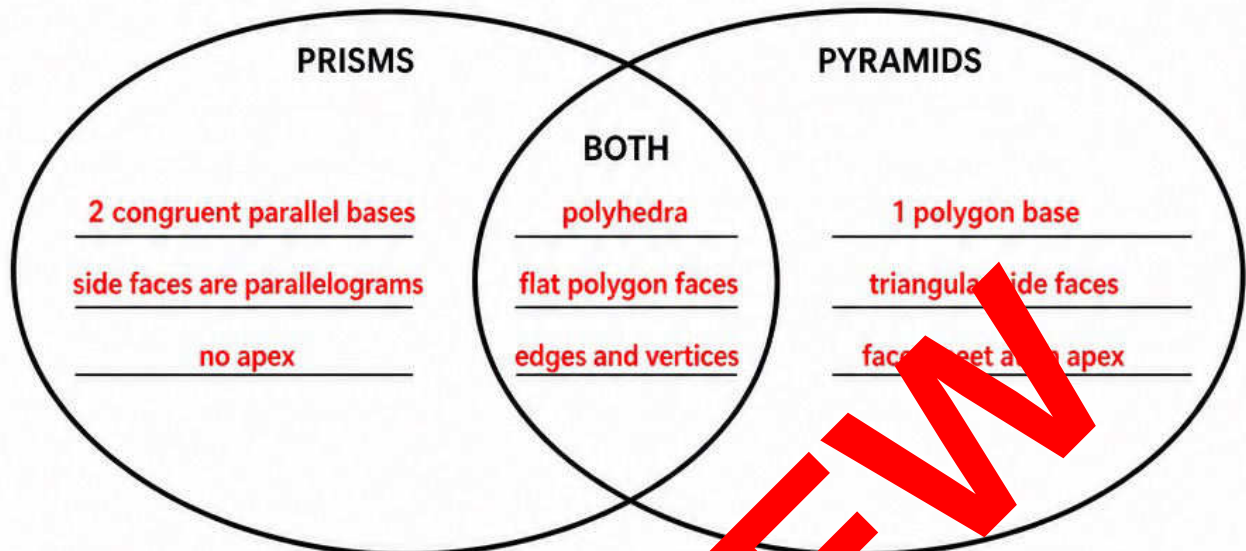
COMPARE AND EXPLAIN

Name: ANSWERS

Date: _____

A. Prism or pyramid?

Record defining properties in the correct region.



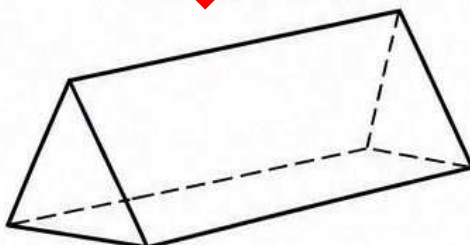
B. True, false or fix it

- Every prism has two congruent, parallel bases. True ☒ False ☐ _____
- Every pyramid has rectangular side faces. True ☐ False ☒ Side faces are triangles.
- A right prism has side edges perpendicular to its bases. True ☒ False ☐ _____
- Every cross-section of a prism matches its base. True ☐ False ☒ Only a cut parallel to a base matches it.
- A pyramid has one polygon base. True ☒ False ☐ _____
- An oblique prism is not a prism. True ☐ False ☒ An oblique prism still has 2 congruent parallel bases.

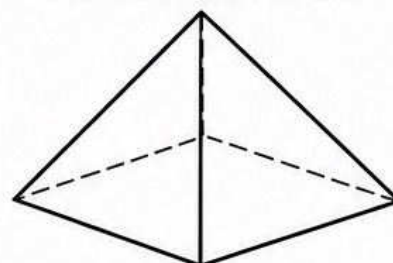
C. Compare the solids

Compare their bases, faces, edges and vertices. Explain one similarity and two differences.

TRIANGULAR PRISM



SQUARE-BASED PYRAMID



Both are polyhedra with 5 faces. A triangular prism has 2 triangular bases,
3 rectangular side faces, 9 edges and 6 vertices. A square-based pyramid has
1 square base, 4 triangular side faces, 8 edges and 5 vertices.
The pyramid has an apex; the prism does not.

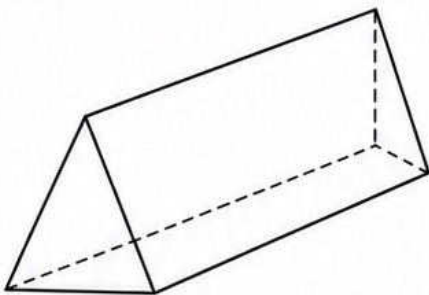
GALLERY ROOF DESIGN BRIEF

Assessment — Page 1 of 2

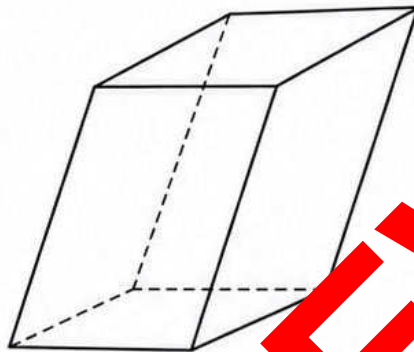
Name: _____

Date: _____

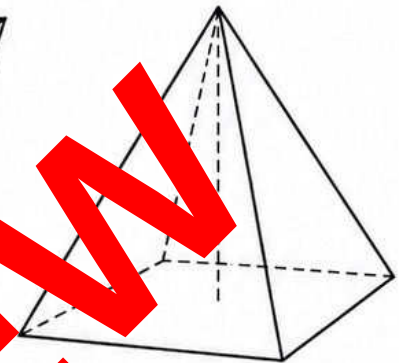
SCENARIO: A community gallery needs a roof form that can be repeated along a straight building. The design team proposes three solid models.



MODEL A



MODEL B



MODEL C

1	Classify each model as a right prism, oblique prism or pyramid. Give one defining property.
A	
B	
C	
2	For Model A, state the number of faces, edges and vertices. Faces: _____ Edges: _____ Vertices: _____
3	For Model B, explain how you know it is still a prism even though it leans. _____ _____ _____
4	For Model C, describe its base and its side faces. _____ _____ _____

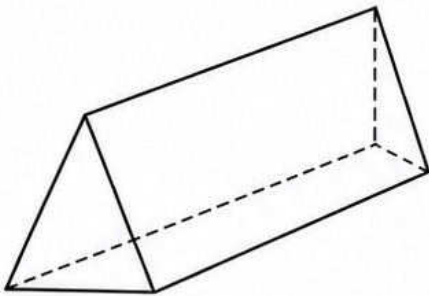
GALLERY ROOF DESIGN BRIEF

Assessment — Page 1 of 2

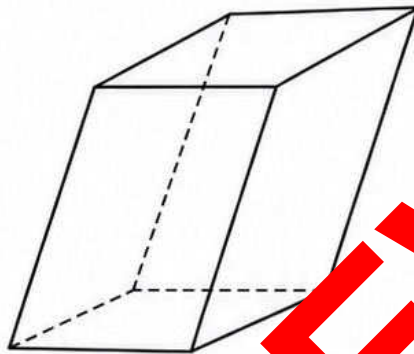
Name: **ANSWERS**

Date: _____

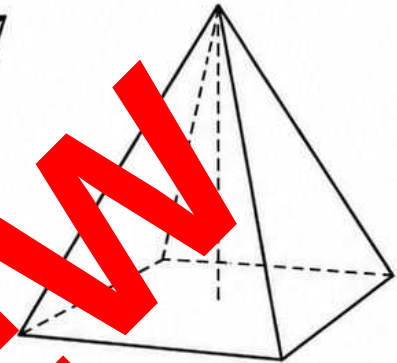
SCENARIO: A community gallery needs a roof form that can be repeated along a straight building. The design team proposes three solid models.



MODEL A



MODEL B



MODEL C

1 Classify each model as a right prism, oblique prism or pyramid. Give one defining property.

A Right prism — 2 congruent parallel triangular bases; connecting edges are perpendicular.

B Oblique prism — 2 congruent parallel rectangular bases; connecting edges slant.

C Pyramid — 1 square base, 4 triangular faces meet at an apex.

2 For Model A, state the number of faces, edges and vertices.

Faces: **5** Edges: **9** Vertices: **6**

3 For Model B, explain how you know it is still a prism even though it leans.

It has two congruent, parallel rectangular bases.

Leaning changes the angle of its side edges, not the prism definition.

4 For Model C, describe its base and its side faces.

It has one square base and four triangular side faces

that meet at one apex.

GALLERY ROOF DESIGN BRIEF

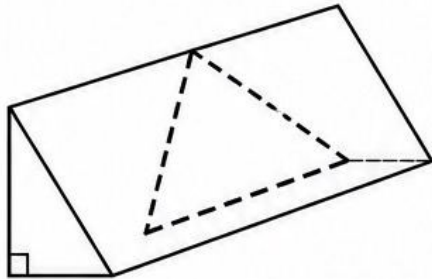
Assessment — Page 2 of 2

Name: _____

Date: _____

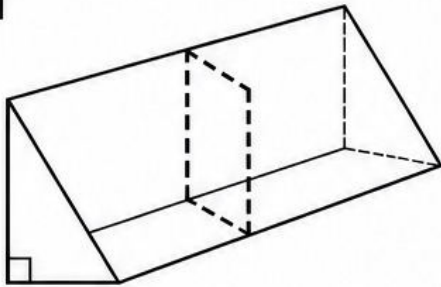
Use the same three models from Page 1: A is the triangular-prism roof, B is the leaning prism, and C is the square-pyramid roof.

5



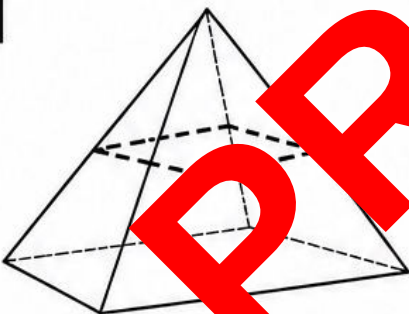
Predict and name the cross-section. Explain.

6



Predict and name the cross-section. Explain.

7



Predict and name the cross-section. Explain how its size compares with the base.

8

Recommend a roof

The chosen roof must have two congruent, parallel end faces and rectangular side faces. It must continue with the same cross-section along the building.

Choose Model A, B or C. Justify your recommendation with at least two geometric properties and one cross-section fact.

GALLERY ROOF DESIGN BRIEF

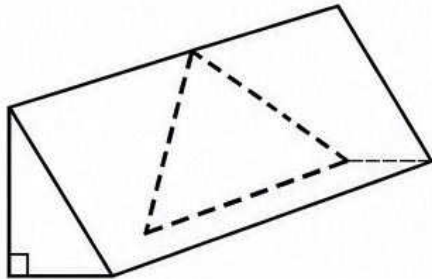
Assessment — Page 2 of 2

Name: **ANSWERS**

Date: _____

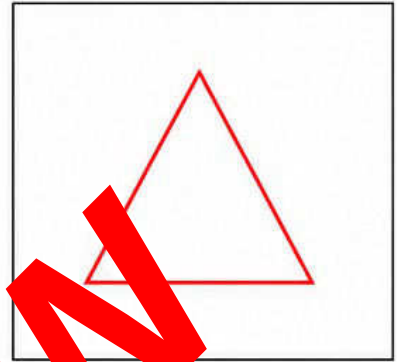
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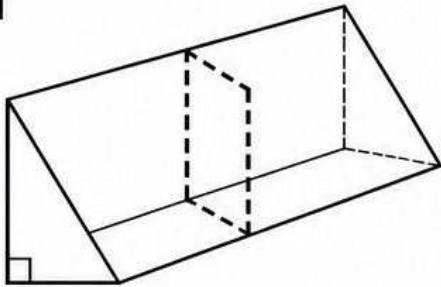


Predict and name the cross-section. Explain.

Triangle. A plane parallel to a triangular base produces a congruent triangular cross-section.

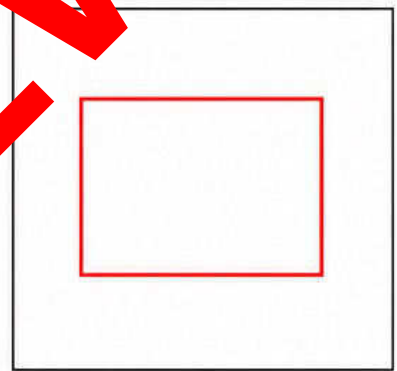


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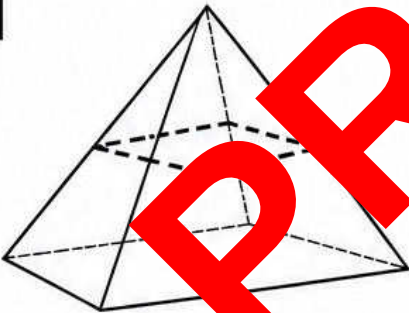


Predict and name the cross-section. Explain.

Rectangle. The cross-section is perpendicular to the length of the prism, spans the length between corresponding edges.

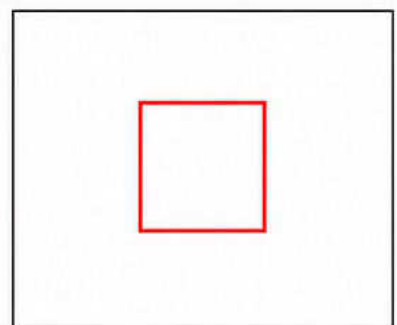


7



Predict and name the cross-section. Explain how its size compares with the base.

Square. It is similar to the square base but smaller because the cut is halfway toward the apex.



8

Recommend a roof

The chosen roof must have two congruent, parallel end faces and rectangular side faces. It must continue with the same cross-section along the building.

Choose Model A, B or C. Justify your recommendation with at least two geometric properties and one cross-section fact.

Model A. It has two congruent, parallel triangular ends and three rectangular side faces. Its side edges are perpendicular to the bases, and the same triangular cross-section continues along the building.

PRISMS AND PYRAMIDS UPDATE — ASSESSMENT RUBRIC

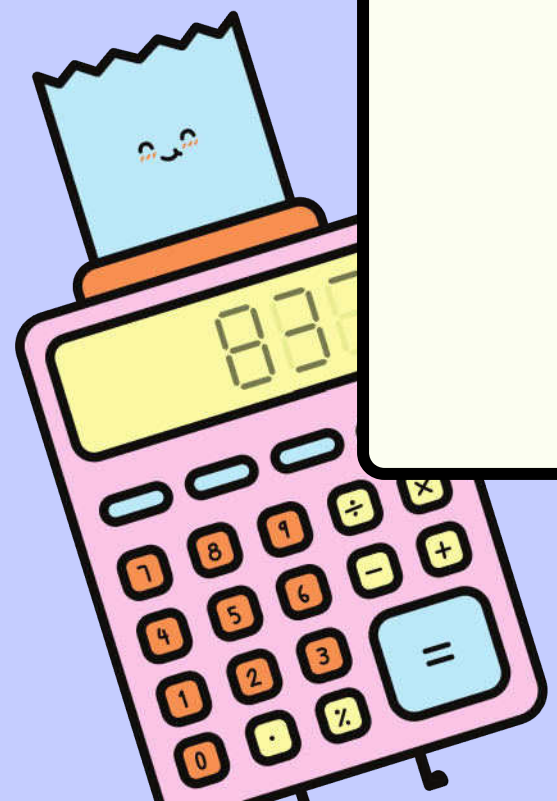
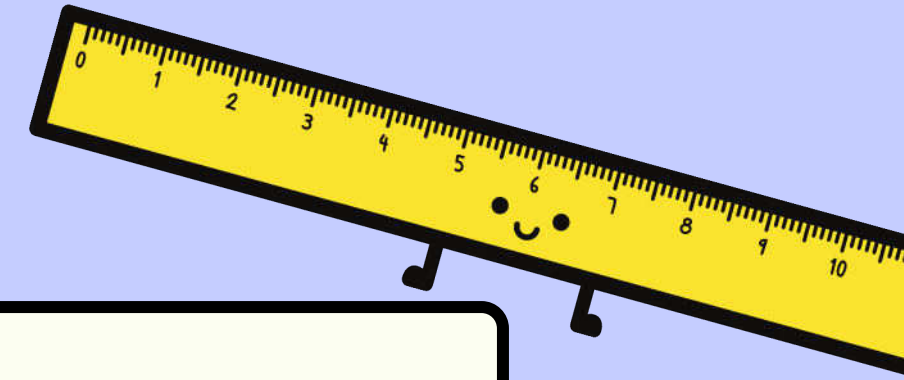
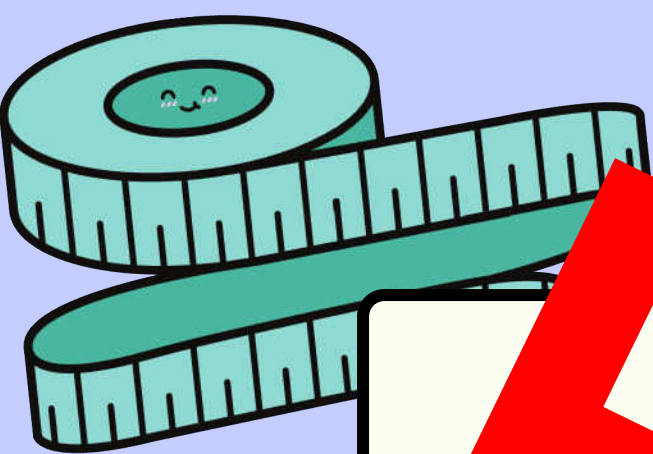
Student: _____ Class: _____ Date: _____ Teacher: _____

CRITERIA	BEGINNING	DEVELOPING	ACHIEVING	CONFIDENT	EXCEEDING
1 CLASSIFY SOLIDS	Names few solids accurately.	Classifies common prisms and pyramids with support.	Accurately classifies right prisms, oblique prisms and pyramids.	Classifies varied solids and justifies choices with defining properties.	Classifies unfamiliar solids and evaluates ambiguous representations precisely.
2 USE PROPERTIES	Lists isolated features.	Identifies bases, faces, edges or vertices.	Uses bases, faces, edges and vertices accurately.	Connects properties and generalises prism patterns.	Builds and defends general rules using precise geometric language.
3 CROSS-SECTION REASONING	Makes unsupported guesses.	Predicts simple sections with prompts.	Predicts and explains sections parallel or perpendicular to a base.	Explains how cut direction and position affect shape and size.	Visualises complex sections and compares multiple valid cuts.
4 MATHEMATICAL COMMUNICATION	Response is incomplete or unclear.	Uses some relevant words or diagrams.	Uses clear diagrams and correct mathematical terms.	Links diagrams, properties and reasoning in a logical explanation.	Communicates rigorous, efficient arguments and critiques alternatives.

Overall level: ☐ BEGINNING ☐ DEVELOPING ☐ ACHIEVING ☐ CONFIDENT ☐ EXCEEDING

Feedback / next step: _____

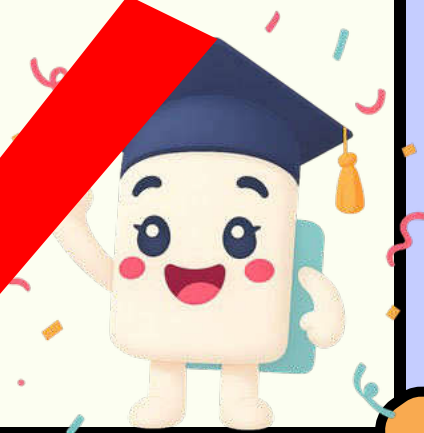




Prisms & Pyramids

Learning Focus

Classify solids • compare properties • predict cross-sections



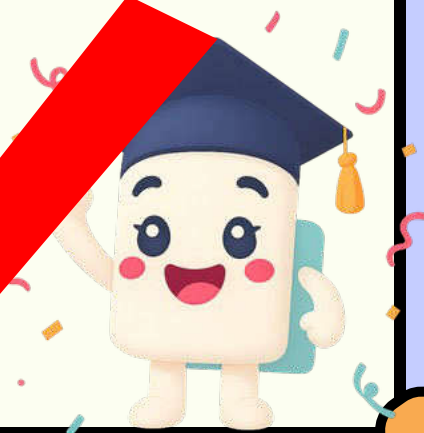
Prism Definition

Two congruent parallel polygon bases joined by parallelogram
faces.



Right Prisms

Connecting edges meet the bases at right angles (90°).



Oblique Prisms

Bases stay parallel and congruent; connecting edges slant.



Pyramid Definition

One polygon base, triangular side faces meet at one apex.



Prism or Pyramid?

Prism: two parallel bases. Pyramid: one base and an apex.



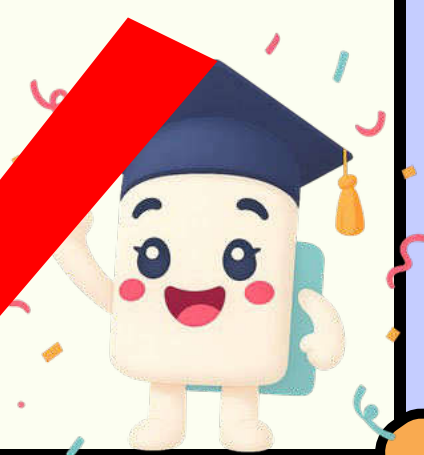
Naming Prisms

Triangle → triangular prism hexagon → hexagonal prism



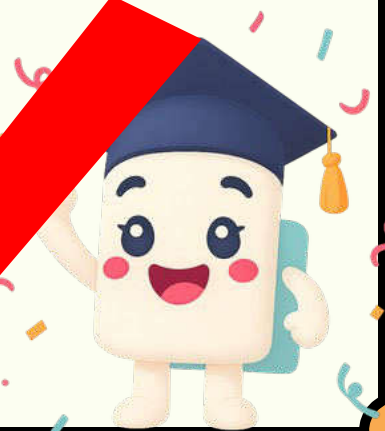
Stack a Shape

Stack congruent polygons straight upward to form a right prism.



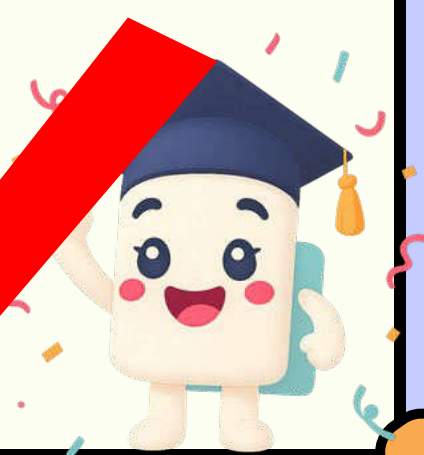
Prism Properties

For an n -sided prism: faces $n + 2$ • edges $3n$ • vertices $2n$



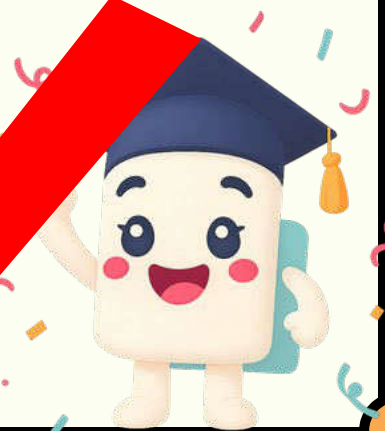
Parallel Cuts

A cut parallel to a prism's base makes the same 2D shape.



Perpendicular Cuts

This cut crosses s faces; its shape depends on the solid.



Diagonal Cuts

Trace over the cutting plane intersects.



Property Example

Two hexagonal bases + 90° edges $\rightarrow$ right hexagonal prism



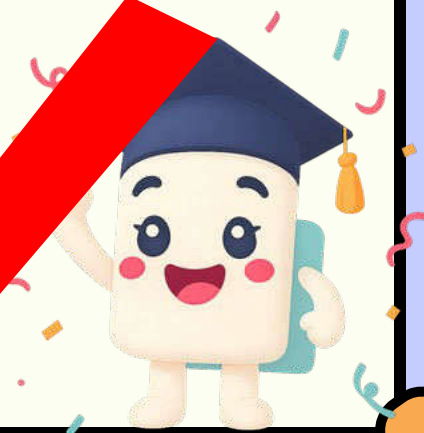
Property Example

One square base + four triangles meeting at an apex $\rightarrow$ square pyramid



Solids in Context

Test the bases, side faces, edge angles and presence of an apex.



Prism Detective Sort

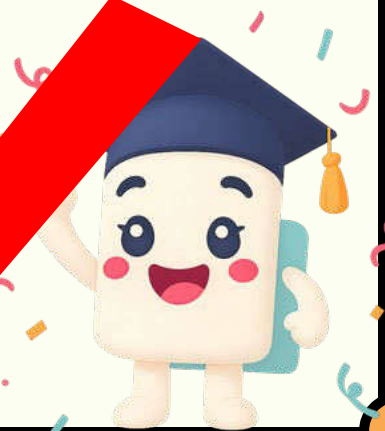
Sort each card, name its category, then prove the choice.

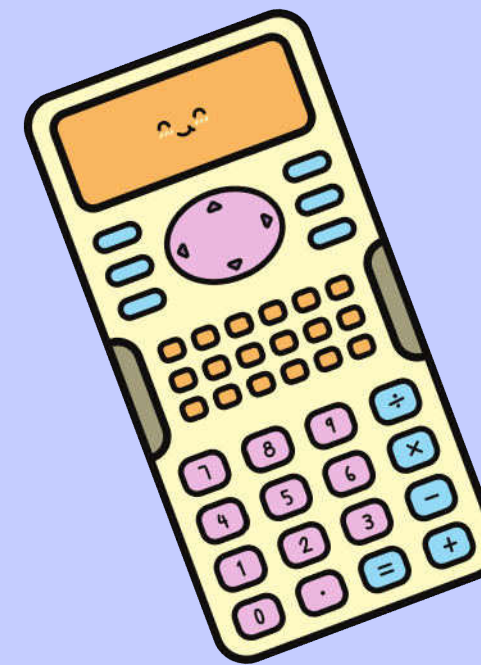
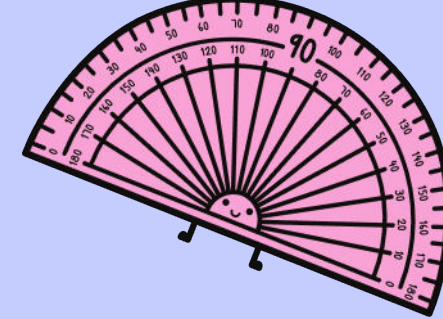
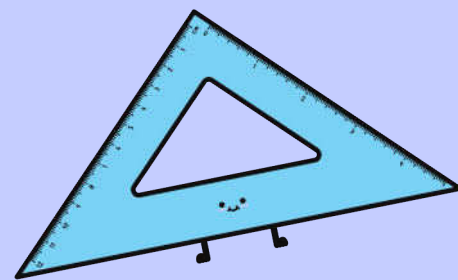
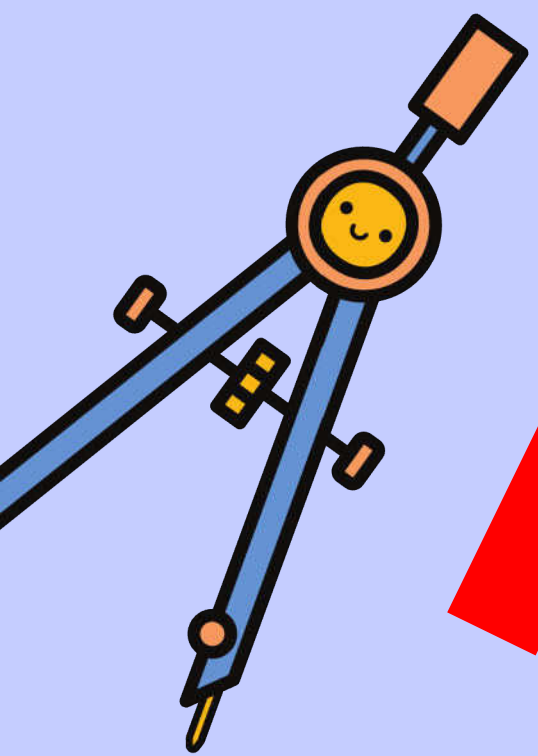


Explain It

Which evidence matters most—and why?

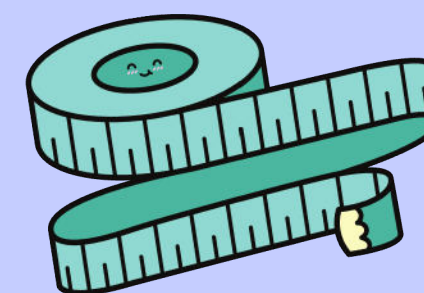
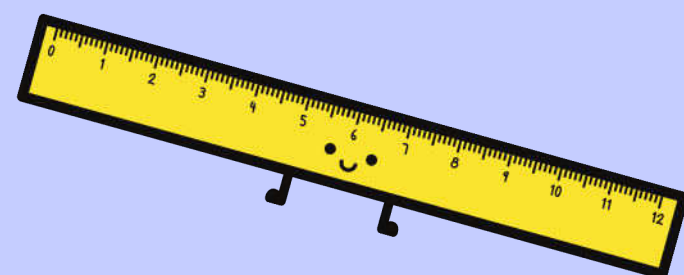
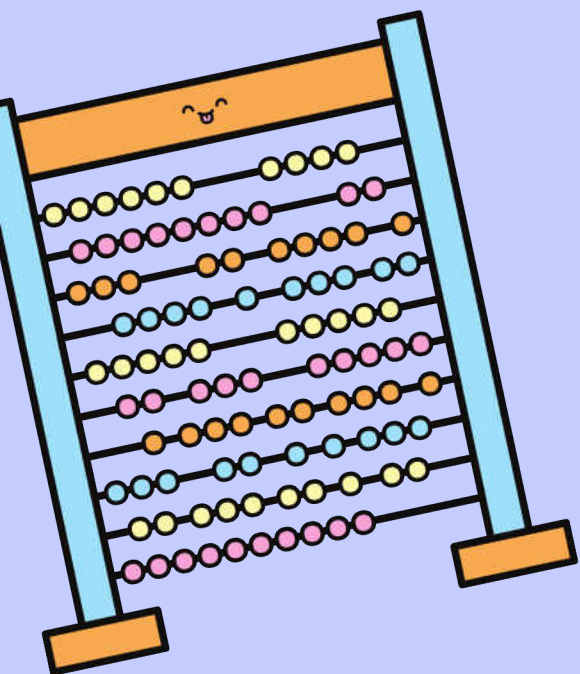
PREVIEW

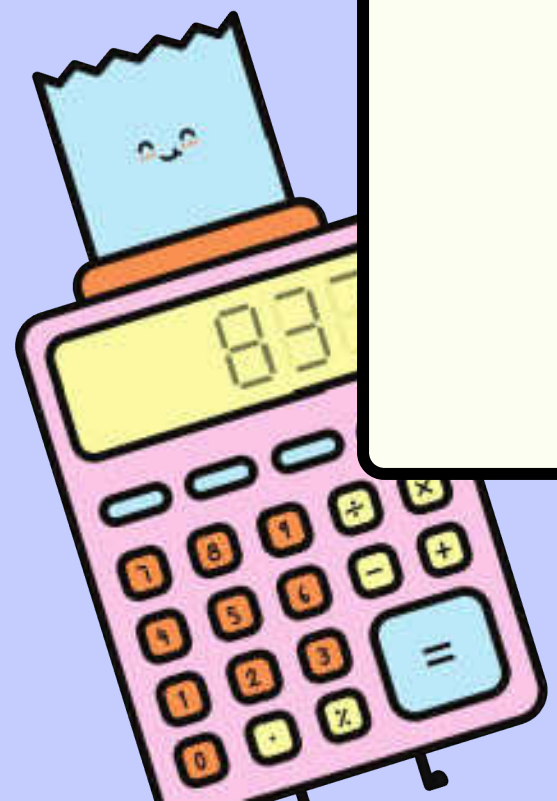
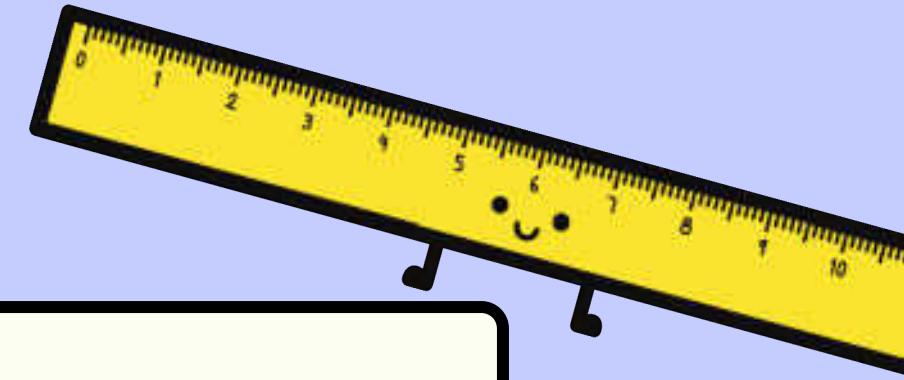
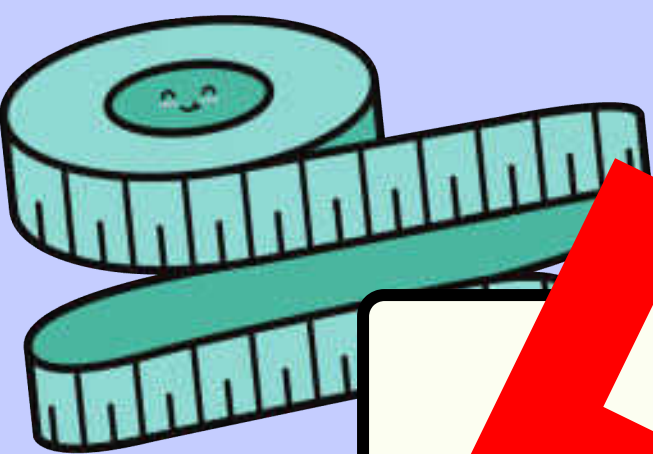




PREVIEW

Well Done!





Prisms & Pyramids Quiz

1. Defining a Prism

A apex • B 2 matching parallel bases • C curved face • D circle



Answer 1

— two congruent, parallel bases.



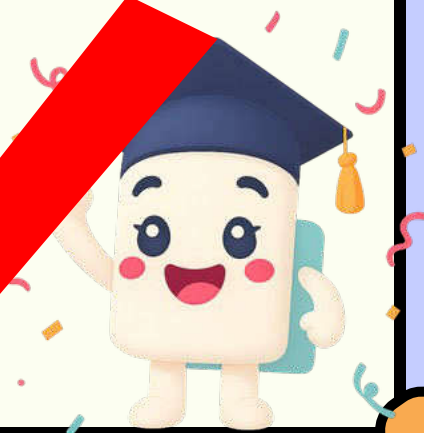
True or False?

Even a right prism is a right prism.



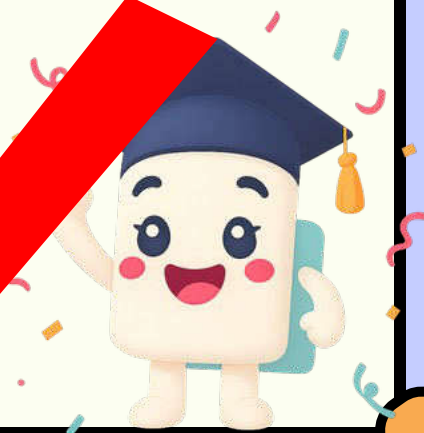
Answer 2

False — an oblique prism has slanting connecting edges.



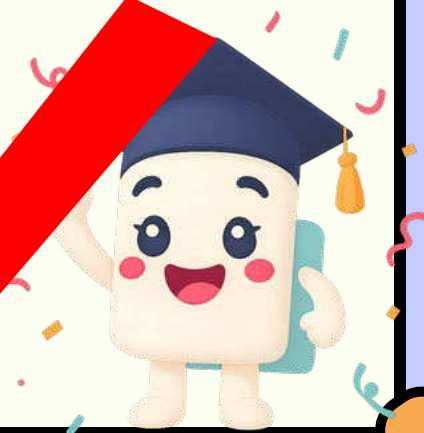
3 Prism or Pyramid?

Explain the defining difference in one sentence.



Answer 3

Prism: 2 congruent parallel bases. Pyramid: 1 base and an apex.



Find the Non-Prism

A triangular prism • B cube • C square pyramid • D oblique prism



Answer 4

C — a square pyramid has one base and an apex.



5 Name the Solid

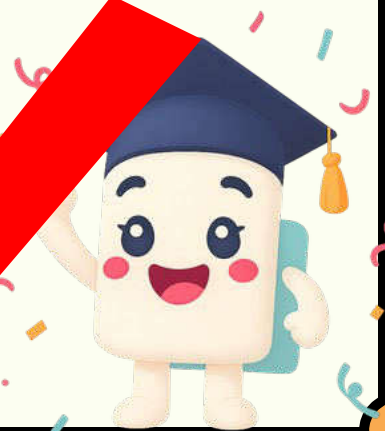
Its two congruent, parallel bases are pentagons.



Answer 5

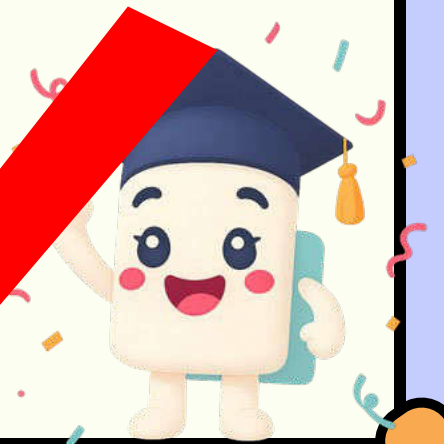
pentagonal prism.

PREVIEW



True or False?

A cut parallel to a prism's base matches the base shape.



Answer 6

True – it produces a congruent cross-section.



7. Right-Prism Evidence

A apex • B curves • side edges at 90° to bases • D slant



Answer 7

C — side edges meet the bases at right angles (90°).



8. Build a Prism

How does stacking congruent polygons straight upward create
one?



Answer 8

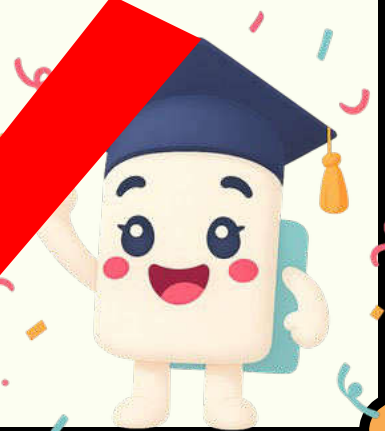
First and last vertices form sides; matching vertices form side
edges.



Q True or False?

A pyramid has two congruent, parallel bases.

PREVIEW



Answer 9

False — cube has triangular faces meet at an apex.



Do Classify the Solid

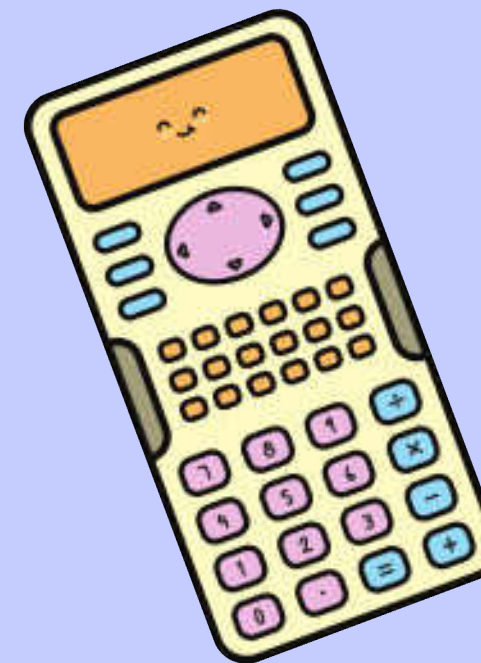
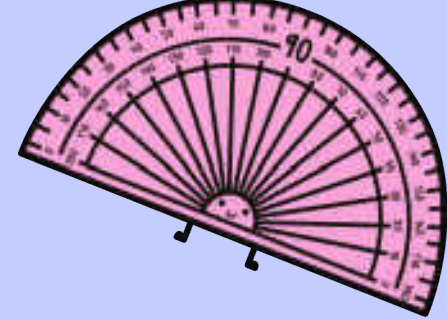
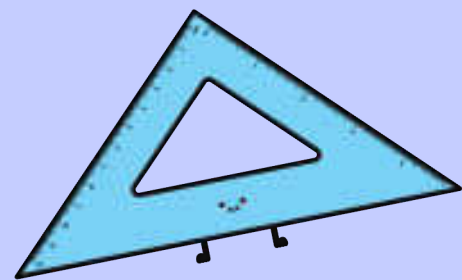
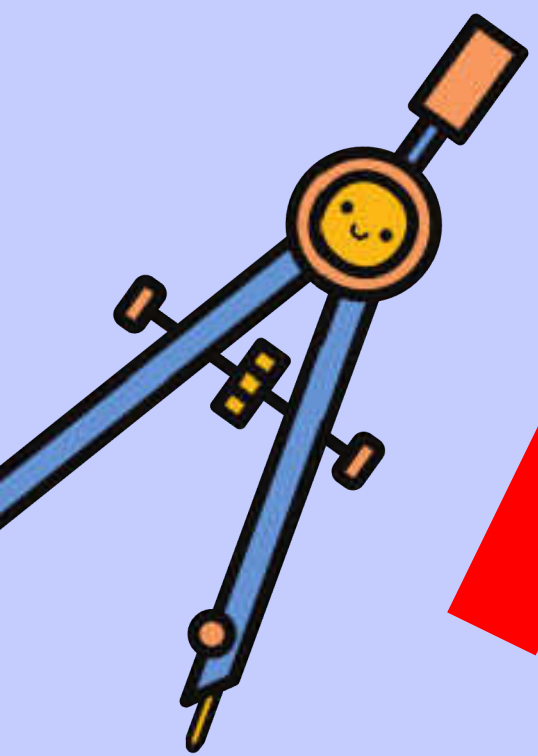
One square base, four triangles meet at one vertex.



Answer 10

Square-based pyramid — the triangles meet at the apex.





PREVIEW

Well Done!

