

Mathletics

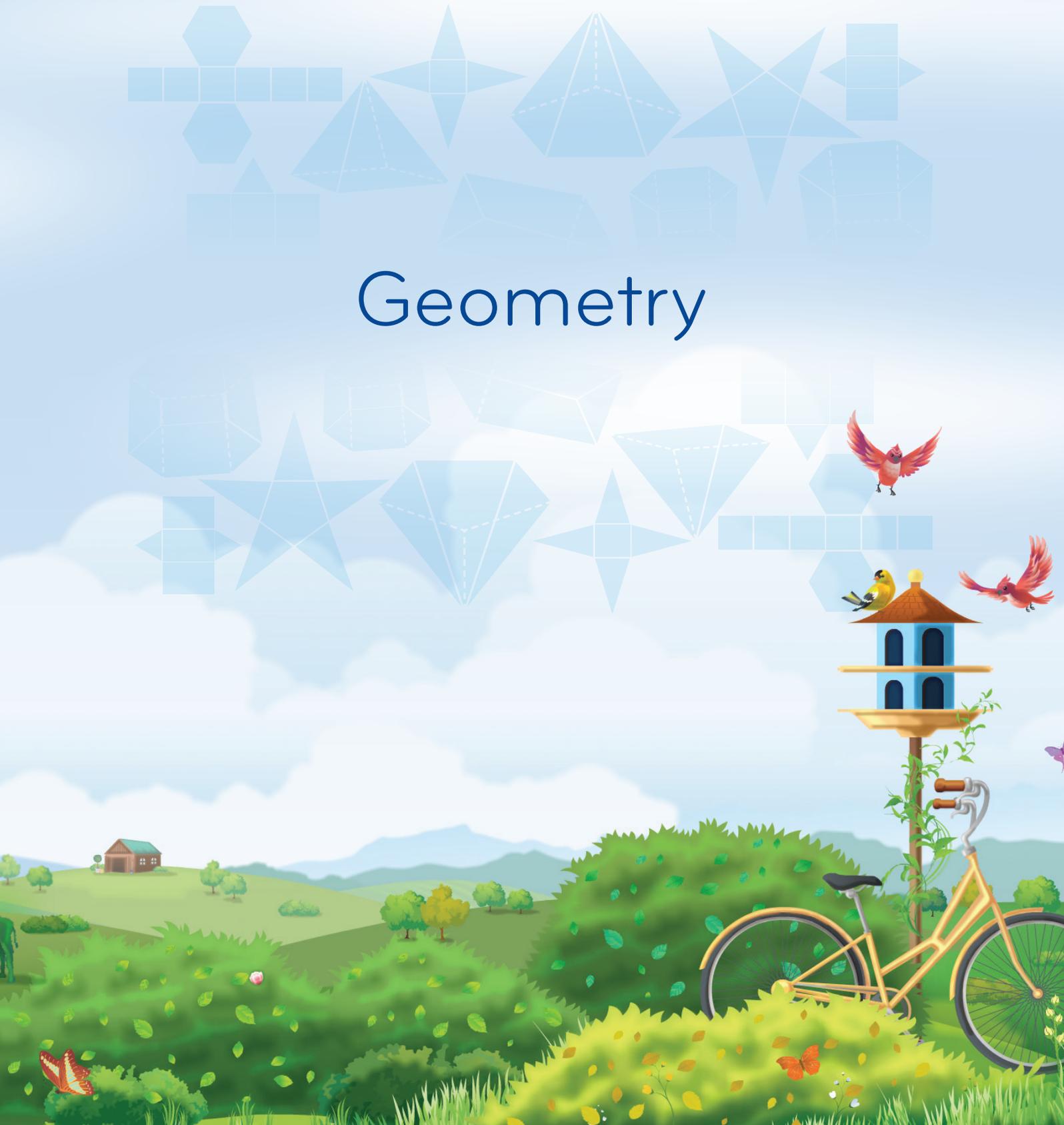
Series



Teacher



Geometry



Series F – Geometry

Contents

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| Student book answers _____ | 1 |
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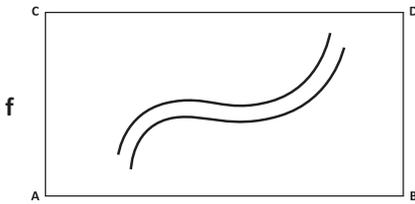
Series Authors:

Rachel Flenley
Nicola Herringer

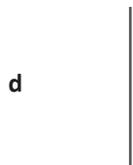
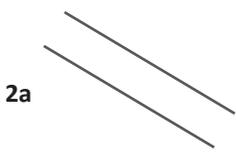
Series F – Geometry

Pages 1–2

- 1a flat
 b right angle
 c yes
 d parallel



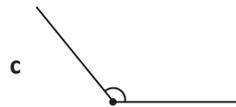
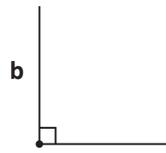
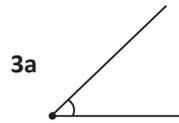
g Answers will vary.



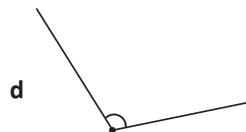
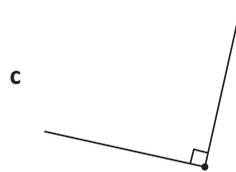
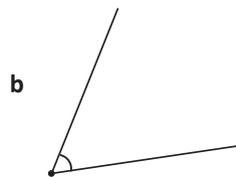
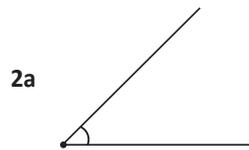
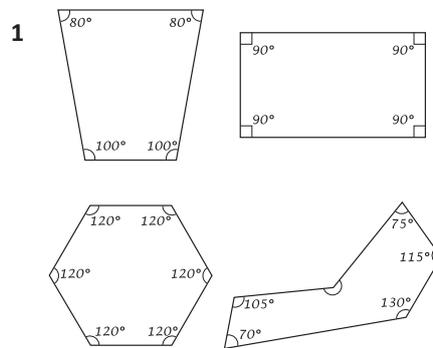
- 3a 180°
 b 90°
 c 45°

Page 3

- 1a acute
 b right
 c obtuse
 d obtuse
 e acute
 f acute
- 2a reflex
 c acute
 d obtuse



Pages 4–5



3 325; 270

Page 6

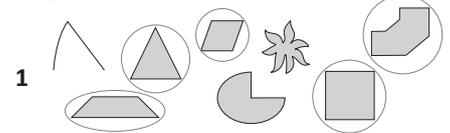
What to do

- a 60
 b 180
 c 330
- a 120
 b 60

What to do next

15°

Pages 7–8



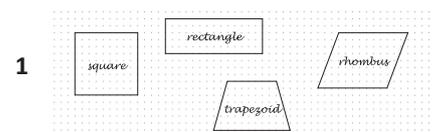
- 2a irregular
 b regular
 c irregular
 d regular
 e regular
 f irregular

3b quadrilateral

- c pentagon
 d hexagon
 e heptagon
 f octagon
 g nonagon
 h decagon
 i hendecagon
 j dodecagon

4 Answers will vary and may include: square, rectangle, quadrilateral, rhombus, kite and arrowhead.

Pages 9–10



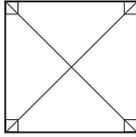
2a 360°

b Teacher check.

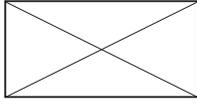
Series F – Geometry

Pages 9–10

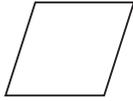
3a square;



b rectangle;



c rhombus;

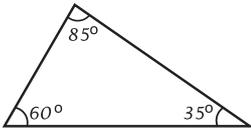
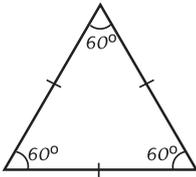


d trapezium;



Pages 11–12

1



2a 2

b 3

c 0

3a 2

b 3

c 0

4 The number of equal angles is the same as the number of equal sides.

5a Yes

b No. Because in an equilateral triangle, each angle is always 60° .

6 Answers will vary.

Pages 13–15

1a 4

b 3

c 8

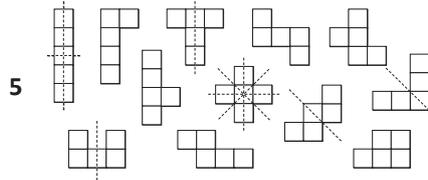
d 6

2 A regular polygon has the same number of lines of symmetry as it has sides.

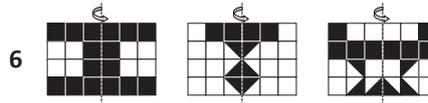
3

| Vertical line of symmetry | Horizontal line of symmetry | More than one line of symmetry | No lines of symmetry |
|---------------------------|-----------------------------|--------------------------------|----------------------|
| A | | | F |
| H | B | | G |
| I | C | | J |
| M | D | | L |
| O | E | H | N |
| T | H | I | P |
| U | I | O | Q |
| V | K | X | R |
| W | O | | S |
| X | X | | Z |
| Y | | | |

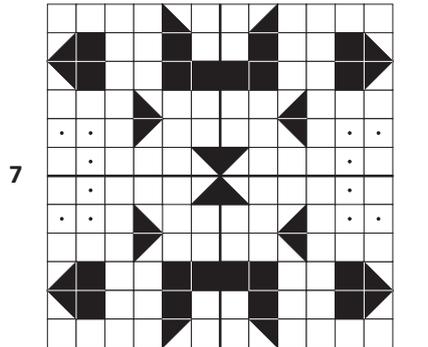
4 Answers will vary.



5



6



7

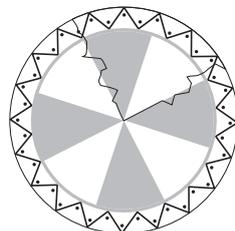
Page 16

What to do

| Shape | Number of sides | Number of triangles | Sum of angles |
|-----------|-----------------|---------------------|---------------|
| square | 4 | 2 | 360° |
| pentagon | 5 | 3 | 540° |
| hexagon | 6 | 4 | 720° |
| octagon | 8 | 6 | $1,080^\circ$ |
| decagon | 10 | 8 | $1,440^\circ$ |
| dodecagon | 12 | 10 | $1,800^\circ$ |

Page 17

What to do



Page 18

1a 6

b squares; rectangles

c rectangle, 4; triangles

d 1; pentagon; 5

2a 4

b 4

c 6

3a ✓

b X; 8

c X; 12

Pages 19–21

1b rectangular

c triangular

d pentagonal

2 They're the same.

3 Answers will vary.

4a hexagonal

b triangular

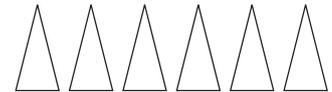
c rectangular

5 They're the same.

6 Hexagon base



6 triangular faces



7 Answers will vary and may include:

– Pyramids and prisms are made up of polygons/flatsides.

– Pyramids and prisms have angles, vertices and edges.

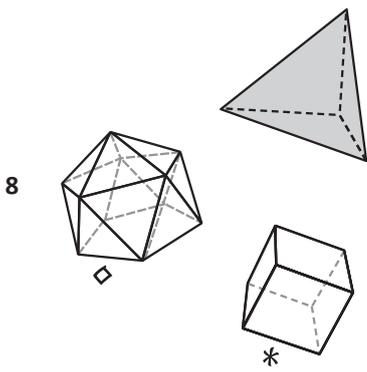
– Pyramids and prisms have straight edges.

– Pyramids have 1 point at the top, prisms don't.

– The sides of a pyramid are triangular, prisms have rectangular sides.

Series F – Geometry

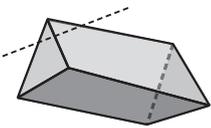
Pages 19–21



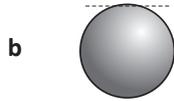
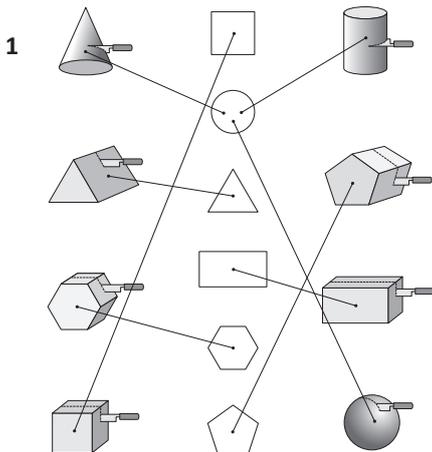
- # octahedron
- tetrahedron
- 4 faces, 6 edges, 4 vertices
- ◇ dodecahedron
- ◇ icosahedron
- # 8 faces, 12 edges, 6 vertices
- ◇ 12 faces, 30 edges, 20 vertices
- * cube or hexahedron
- * 6 faces, 12 edges, 8 vertices
- ◇ 20 faces, 30 edges, 12 vertices

9 Answers will vary.

10 Answers will vary.
Possible answer:



Page 22



Page 24

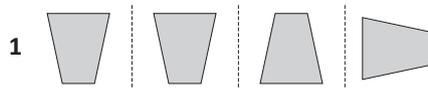
What to do

Observe students.

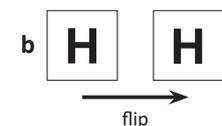
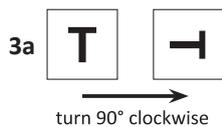
What to do next

Answers will vary.

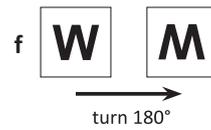
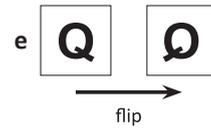
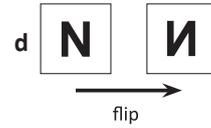
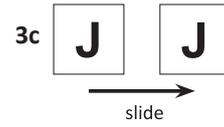
Pages 25–26



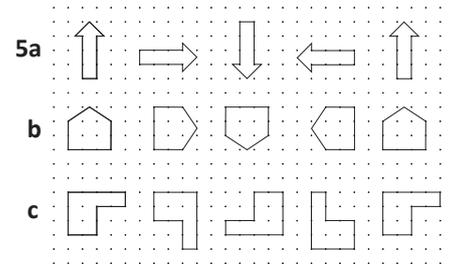
2 slide; turn; flip; slide; turn; flip



Page 23



4 Answers will vary.

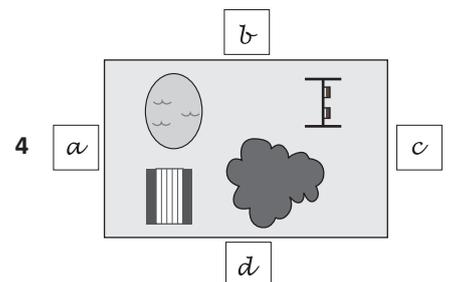
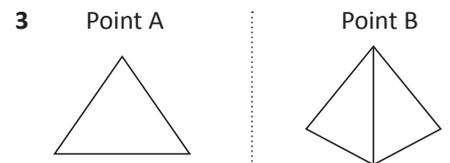


Pages 27–28



No, the chest is not on the left hand side because I am in a different position so it's now on my right hand side.

2 Answers will vary.



Series F – Geometry

Pages 27–28

5 Answers will vary.

Pages 29–30

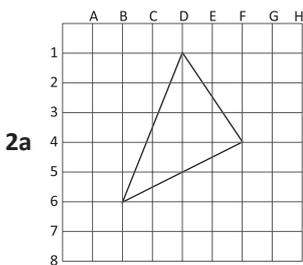
1a, b Teacher check.

2 Teacher check.

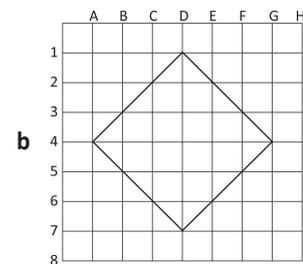
3 Teacher check.

Pages 31–35

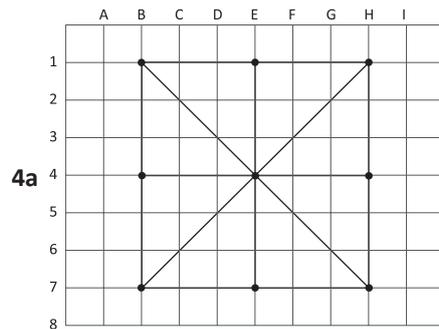
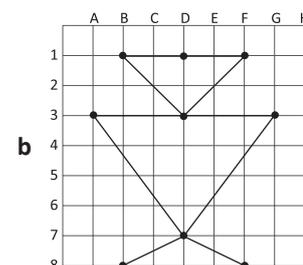
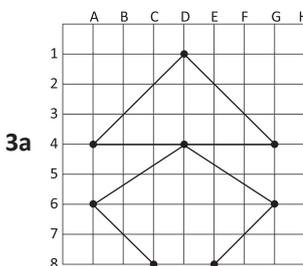
| | | |
|---|---|----|
| 1 | ☺ | G5 |
| | ◆ | E7 |
| | ⌘ | B7 |
| | ★ | D5 |
| | ✿ | F2 |
| | ⊗ | B1 |
| | ❖ | A4 |



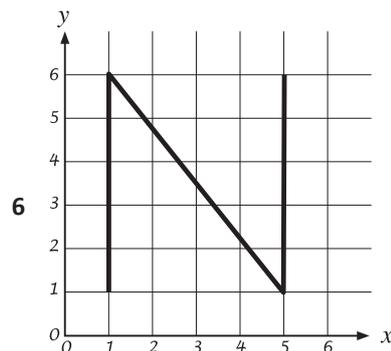
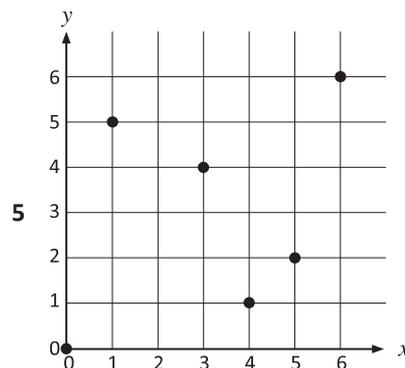
Triangle



Square

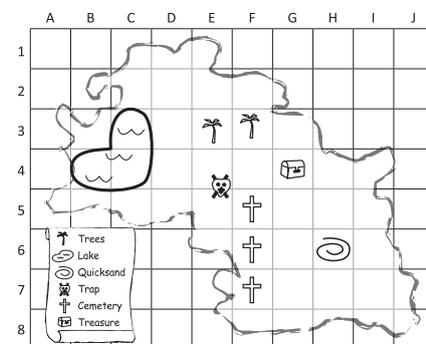


b 16



7 Answers will vary.

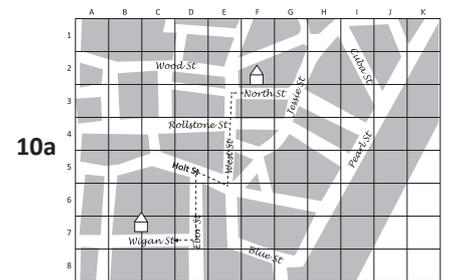
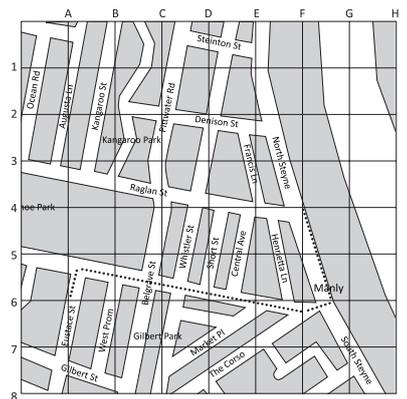
8a-f



9a Steinton and Whistler Streets

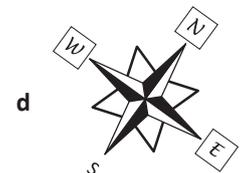
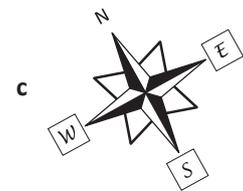
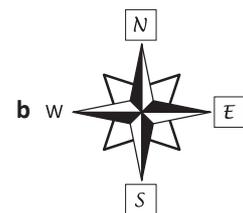
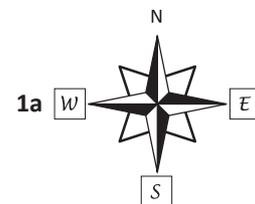
b On South Steyne

9c See dotted line on the map.



b From North St, turn left into West St; then turn right into Holt St; then turn left into Ebor St; then turn right into Wigan St.

Pages 37–38



Lines and angles

Name _____

1 Draw:

a 2 parallel lines

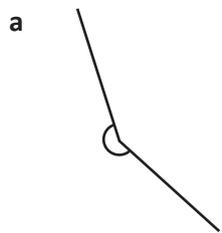
b 2 lines perpendicular to each other

c a horizontal line

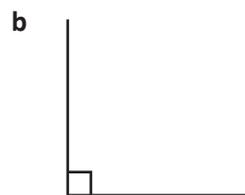
d a vertical line



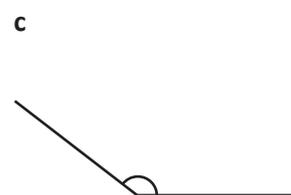
2 Label each of these angles as right, acute, reflex or obtuse:



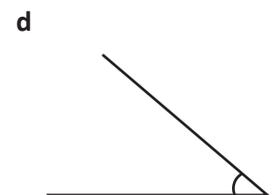
angle



angle



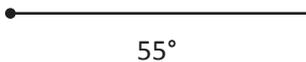
angle



angle

3 Draw an angle that is:

a



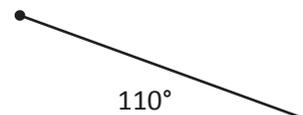
55°

b



90°

c



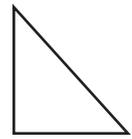
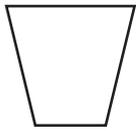
110°

| Skills | Not yet | Kind of | Got it |
|---|---------|---------|--------|
| • Knows terms parallel, perpendicular, horizontal, vertical | | | |
| • Recognises and labels acute, obtuse, right angled and reflex angles | | | |
| • Draws angles to 5° markers | | | |

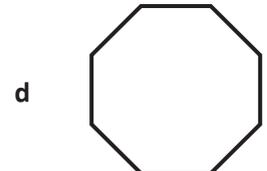
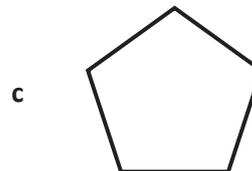
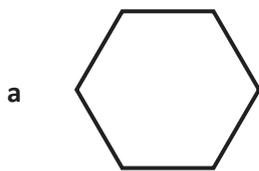
2D shapes

Name _____

1 Circle the polygons:



2 Name these polygons:



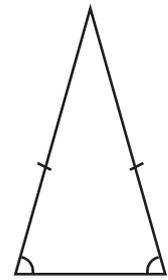
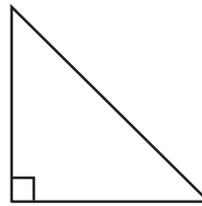
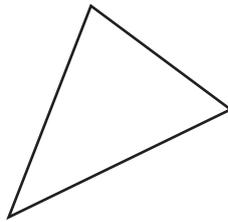
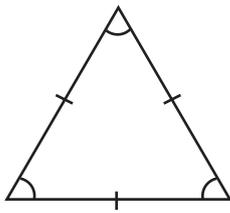
3 Look at the following two quadrilaterals. Name them and list their properties:



2D shapes

Name _____

4 Draw a line from the label to the correct triangle:



isosceles triangle

right angled triangle

equilateral triangle

scalene triangle

5 If I drew a shape and the sum of the angles was 180° , what shape could I have drawn? Draw it.

6 Name and draw this mystery shape:

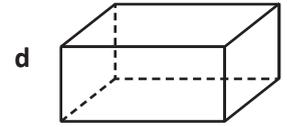
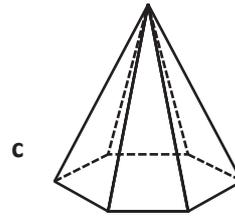
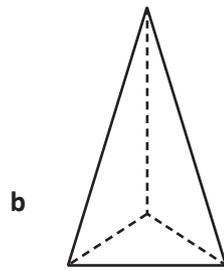
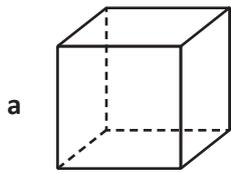
I have 4 sides. All of my angles are equal. If you draw in my diagonals, the lines form right angles where they intersect.

| Skills | Not yet | Kind of | Got it |
|--|---------|---------|--------|
| • Recognises and names simple polygons | | | |
| • Names properties of simple quadrilaterals | | | |
| • Recognises and names different types of triangles | | | |
| • Uses knowledge of shape properties to identify simple polygons | | | |

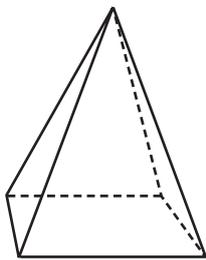
3D shapes

Name _____

1 Name these 3D shapes:

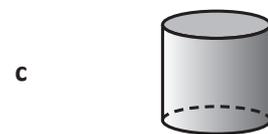
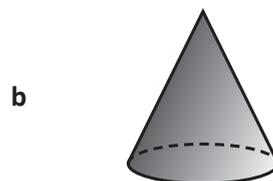
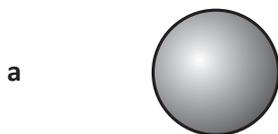


2 Name this shape and list the properties. Make sure you identify how many edges, faces and vertices it has:

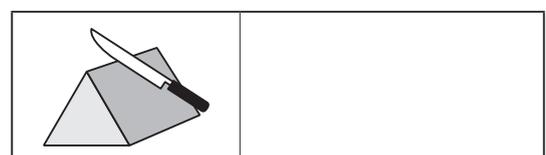
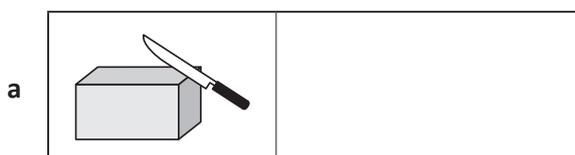


3 How are prisms and pyramids similar? How are they different? Explain using words and/or diagrams:

4 Label each of these 3D shapes:



5 Draw the cross section next to each shape:

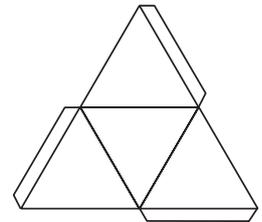
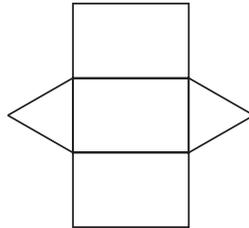
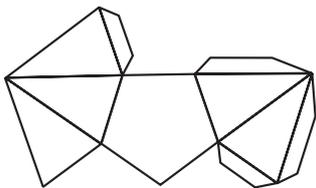


3D shapes

Name _____

6 What is a net? Explain it using words. (We mean the mathematical kind, not the catching butterflies kind.)

7 Draw lines to match the nets to the correct shape names:

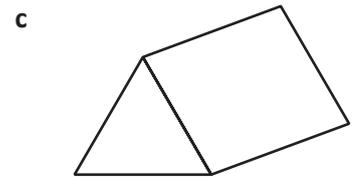
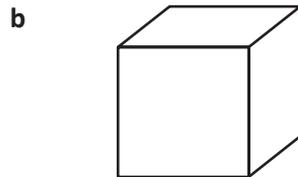
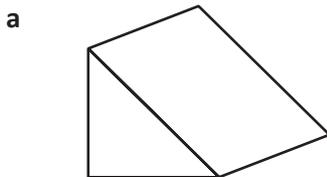


triangular prism

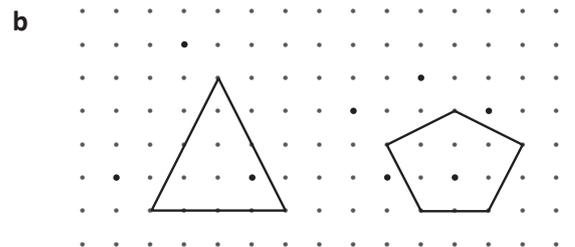
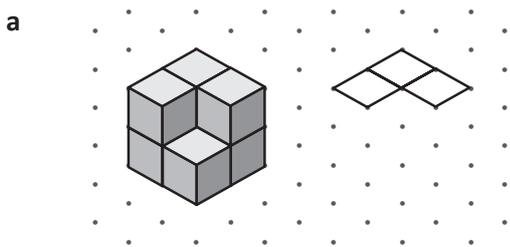
triangular pyramid

pentagonal prism

8 Draw in dotted lines to reveal the missing edges, sides and vertices of these shapes:

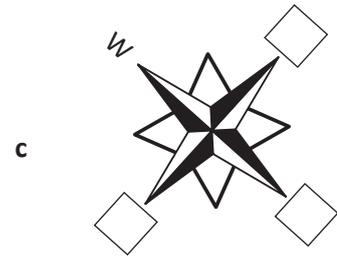
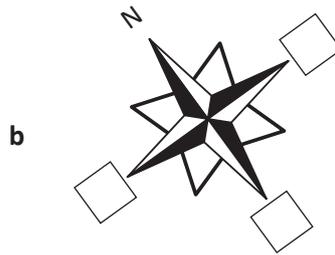
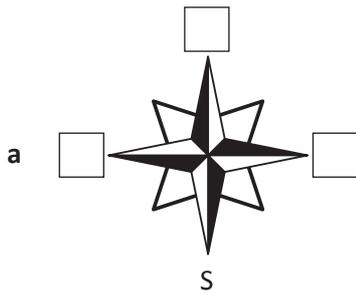


9 Complete these 3D shape drawings:



| Skills | Not yet | Kind of | Got it |
|--|---------|---------|--------|
| • Identifies and names simple polyhedrons | | | |
| • Identifies properties of a square based pyramid, including faces, edges and vertices | | | |
| • Describes similarities and differences between pyramids and prisms | | | |
| • Visualises and represents cross sections of polygons | | | |
| • Visualises and describes nets | | | |
| • Sketches 3D models | | | |

1 Add the missing compass points:



2 Name a place or geographical feature that is:

a north of your town or city

b east of your town or city

c south of your town or city

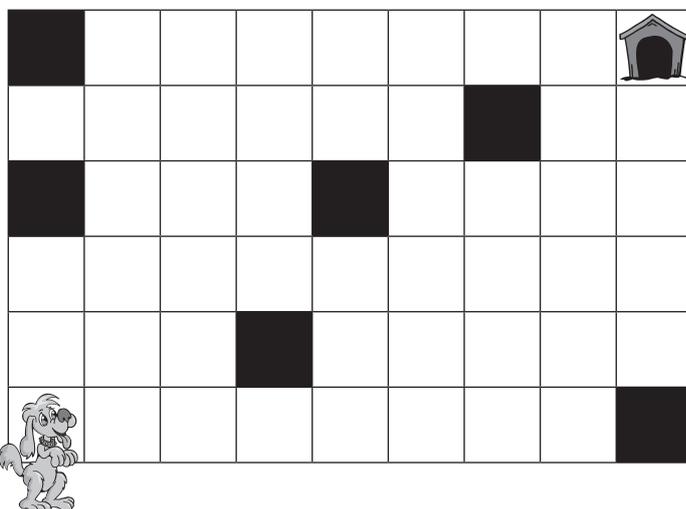
d west of your town or city

3 Draw the following on this table top:

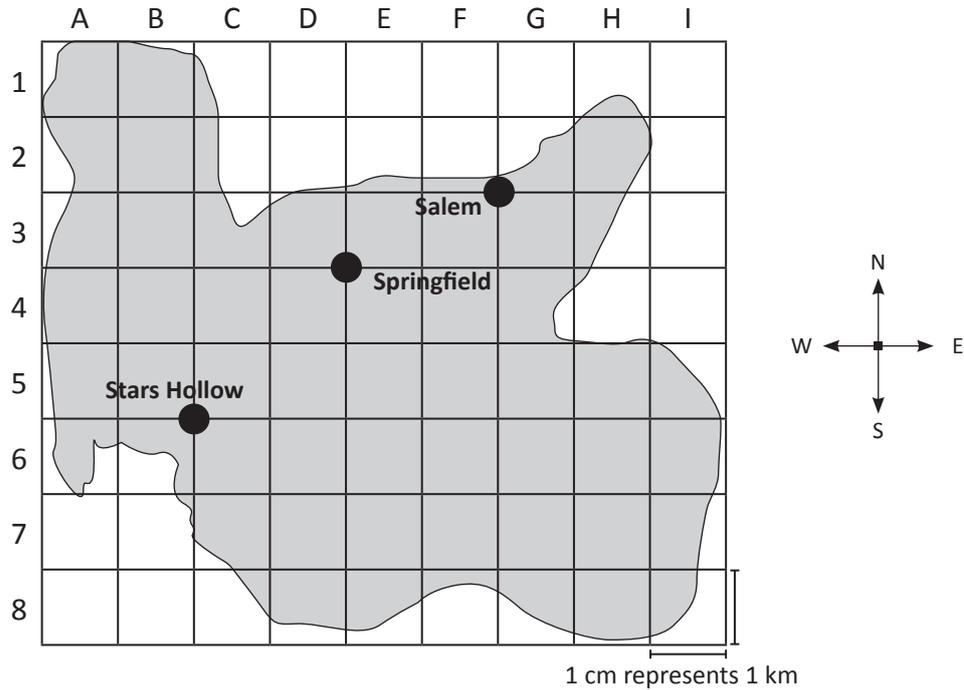
- a an apple in the top right hand corner
- b a banana in the bottom left hand corner
- c a biscuit directly below the apple
- d a glass of milk to the left of the biscuit
- e a pizza slice in the bottom right hand corner
- f a cupcake in the corner diagonally opposite the pizza slice



4 Write a set of directions that would get the dog home to his kennel. It cannot travel through any blacked out square.



5 Complete the following:



- a Add a town called Jonestown at A1.
- b Add a town called Palm Springs 5 km east of Stars Hollow.
- c Add a mountain at G7.
- d Add a lake that covers both points D6 and D5.
- e Add a town called Crabapple 3 km south of Jonestown.
- f Name 2 towns that sit on the same horizontal line. _____
- g What town is north of the lake? _____
- h What town is west of the lake? _____
- i The best swimming beach is 4 km north of Palm Springs. Draw a beach towel at this point.

| Skills | Not yet | Kind of | Got it |
|--|---------|---------|--------|
| • Names compass points and identifies locations using N S E W | | | |
| • Follows and writes simple directions to place or move objects | | | |
| • Describes the direction of one place or object relative to another | | | |
| • Positions and locates places on maps using coordinate points | | | |
| • Uses a simple scale to calculate distance | | | |

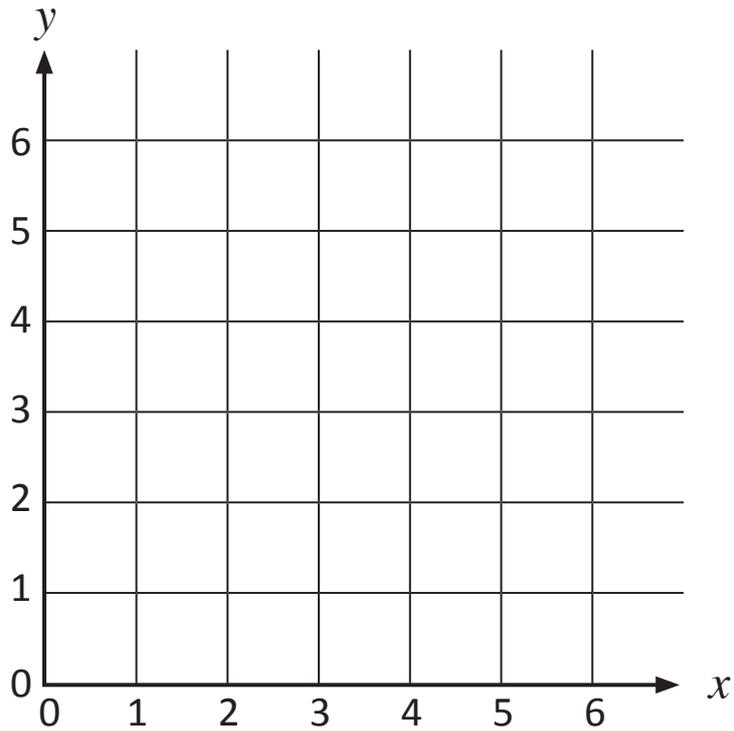
6 Draw lines between the coordinate points below to create a capital letter:

(1, 1) to (2, 6)

(2, 6) to (3, 1)

(3, 1) to (4, 6)

(4, 6) to (5, 1)



7 Transform these letters:

a T
→
 turn 180°

b M
→
 turn 90°

c L
→
 slide

d N
→
 flip

e Q
→
 flip

f Y
→
 turn 180°

| Skills | Not yet | Kind of | Got it |
|--|---------|---------|--------|
| • Names compass points and identifies locations using N S E W | | | |
| • Follows and writes simple directions to place or move objects | | | |
| • Describes the direction of one place or object relative to another | | | |
| • Positions and locates places on maps using coordinate points | | | |
| • Positions and locates points on a coordinate grid | | | |
| • Visualises and represents transformations – flips, slides, turns | | | |

Series F – Geometry – Student Progress Record

Name _____ Class _____ Date _____

What went well: _____

What I need to improve: _____



Series F – Geometry – Student Progress Record

Name _____ Class _____ Date _____

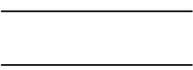
What went well: _____

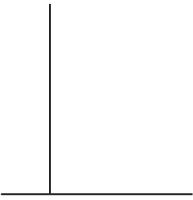
What I need to improve: _____

Series F – Geometry

ASSESSMENT ANSWERS

Page 6

1a 

b 

c 

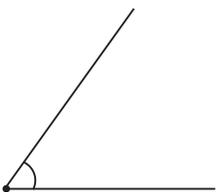
d

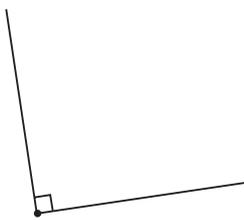
2a reflex

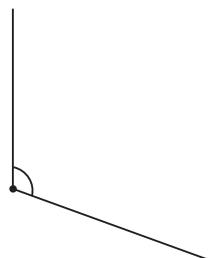
b right

c obtuse

d acute

3a 

b 

c 

Pages 7–8

1 

2a hexagon

b rectangle

c pentagon

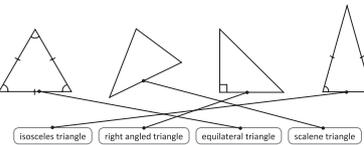
d octagon

3a trapezium

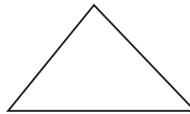
- 4 straight sides.
- 1 pair parallel sides.
- 2 acute angles (equal).
- 2 obtuse angles (equal).

b square

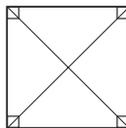
- 4 straight equal sides.
- 2 sets of parallel sides and all angles are right angles.

4 

5 triangle



6 square



Pages 9–10

1a cube or square prism

b triangular pyramid

c hexagonal pyramid

d cuboid or rectangular prism

2 Square based pyramid

- 1 square base–
- 4 triangular faces
- 5 vertices
- 8 edges
- 5 faces

3 Answers will vary and may include:

- Similarities:
 - straight edges
 - 3D shapes

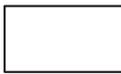
3 Differences:

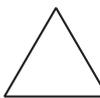
- pyramids come to 1 point at the top
- prisms have 2 matching ends
- the faces of a pyramid are triangles, the faces of a prism are rectangles

4a sphere

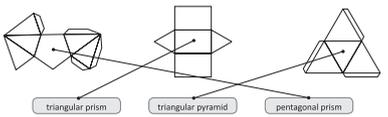
b cone

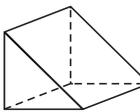
c cylinder

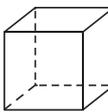
5a 

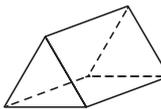
b 

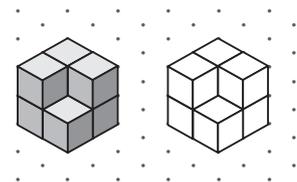
6 Answers will vary.

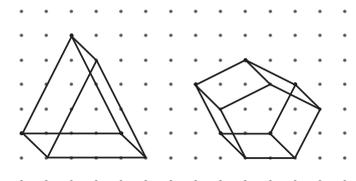
7 

8a 

b 

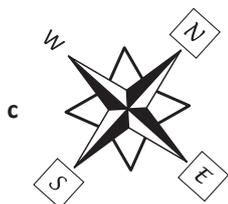
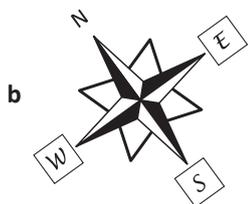
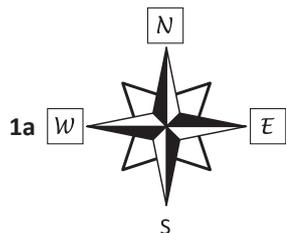
c 

9a 

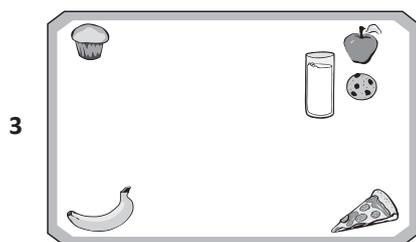
b 

Series F – Geometry

Pages 11–13

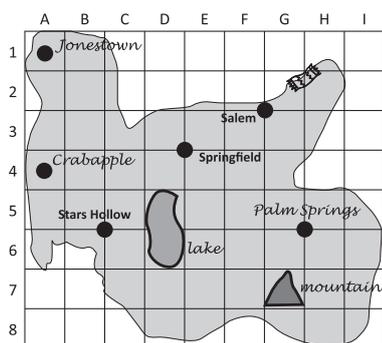


2 Answers will vary.



4 Answers will vary.

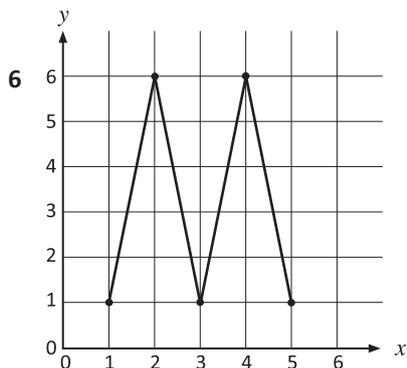
5a–e, i



f Stars Hollow and Palm Springs

g Springfield

h Stars Hollow



turn 180°



turn 90°



slide



flip



flip



turn 180°

Series F – Geometry

| Topic | Reference | Strand | Substrand | Objective |
|------------------|-----------|----------|------------------------|--|
| Lines and angles | 5G2a | Geometry | Properties of shapes | Use the properties of rectangles to deduce related facts and find missing lengths and angles. |
| Lines and angles | 5G4a | Geometry | Properties of shapes | Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. |
| Lines and angles | 5G4b | Geometry | Properties of shapes | Identify: angles at a point and one whole turn (total 360°), angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°), other multiples of 90° . |
| Lines and angles | 5G4c | Geometry | Properties of shapes | Draw given angles, and measure them in degrees ($^\circ$). |
| 2D shapes | 5G2b | Geometry | Properties of shapes | Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. |
| 3D shapes | 5G3b | Geometry | Properties of shapes | Identify 3D shapes, including cubes and other cuboids, from 2D representations. |
| Position | 5P2 | Geometry | Position and direction | Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. |