

## Common 2-D and 3-D Shapes

### Starter

1. **(Review of last lesson)** An isosceles triangle has sides of length 8 cm and 5 cm. Find the possible heights of the triangle.

**Hint:** Draw the two possible diagrams.

**Working:**

Sides 5, 5, and 8.

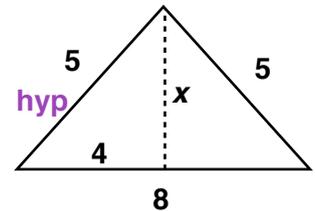
Let  $x$  be the height of the triangle.

$$a^2 + b^2 = c^2 \Rightarrow x^2 + 4^2 = 5^2$$

$$x^2 + 16 = 25$$

$$x^2 = 9$$

$$\therefore x = \sqrt{9} = 3 \text{ cm}$$



Sides 5, 8, and 8.

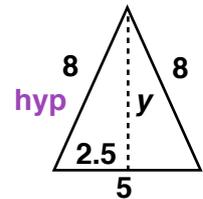
Let  $x$  be the height of the triangle.

$$a^2 + b^2 = c^2 \Rightarrow x^2 + 2.5^2 = 8^2$$

$$x^2 + 6.25 = 64$$

$$x^2 = 57.75$$

$$\therefore x = \sqrt{57.75} = 7.60 \text{ cm (3 s.f.)}$$



The possible heights are 3 cm and 7.60 cm

2. Work with a partner to decide whether the following are true or false:

**Hint:** Go to page 94 or click [here](#) if you need a reminder on some of the shapes.

- A parallelogram has opposite sides and opposite angles equal.
- A square and a rhombus have diagonals that bisect at right angles.  
**N.B.** Bisect means cut in half.
- A kite and an isosceles trapezium have diagonals that are equal.
- The diagonals of a parallelogram cross at right angles.
- The diagonals of a square, arrowhead and rhombus cross at right angles.
- A kite and a rhombus have diagonals that bisect the angles.
- A rhombus can never be split into two equilateral triangles.

**Working:**

(a)	True	(b)	True	(c)	False	(d)	False
(e)	True	(f)	False	(g)	False		

**E.g. 1** What am I?

- A quadrilateral with just one pair of parallel sides is a...
- A quadrilateral with just one line of symmetry is...
- A quadrilateral with equal diagonals that are also perpendicular is a...
- A quadrilateral with parallel sides and equal diagonal is a...

- Working:**
- (a) ...trapezium.
  - (b) ...kite or a isosceles trapezium.
  - (c) ...square.
  - (d) ...rectangle or square.

**E.g. 2** True or false. Explain why or why not?

- (a) All equilateral triangles are isosceles triangles.
- (b) All rectangles are squares.
- (c) All squares are rhombuses.
- (d) All kites are quadrilaterals.
- (e) All quadrilaterals are parallelograms.
- (f) Some rectangles are squares.
- (g) Some parallelograms are kites.
- (h) All rhombuses are parallelograms but a parallelogram is not necessarily a rhombus.

- Working:**
- |     |       |     |       |     |       |     |      |
|-----|-------|-----|-------|-----|-------|-----|------|
| (a) | True  | (b) | False | (c) | True  | (d) | True |
| (e) | False | (f) | True  | (g) | False | (h) | True |

**E.g. 3** Work with a partner.

Guess the shape...you can ask three questions. The answer must either be 'Yes' or 'No'.  
After these three questions, you must guess the shape.  
Which, did you find, are the three most important questions?

Video: [2-D shapes](#)  
Video: [Quadrilaterals](#)  
Video: [3-D solids](#)

[Solutions to Starter and E.g.s](#)

### Exercise

p97 Ex 6.1 Qu 1-7

[Textbook answers \(only available during a lockdown\)](#)