Day 120 **B Tier 10-a-day: Model Solutions**

1 Metric units

(a) Change 5.8 cm to mm.
(b) Change 3780 cm to m.

(a) 1 cm = 10 mm, so multiply by 10: 5.8 × 10 = 58
(b) 1 m = 100 cm, so divide by 100: 3780 ÷ 100 = 37.8
Answer: (a) 58 mm (b) 37.8 m

2 Bar charts

The bar chart shows some information.
(a) How many more were there for Rabbit than for Cat?
(b) Work out the total of all five bars.

(a) Rabbit: 20, Cat: 10
20 − 10 = 10
(b) 25 + 10 + 30 + 20 + 10 = 95
Answer: (a) 10 (b) 95

3 Factors and multiples

(a) Write down all the factors of 45.
(b) Write down all the multiples of 9 between 26 and 53.

(a) Find pairs that multiply to make 45: 1 × 45, 3 × 15, 5 × 9
(b) Count up in 9s: 27, 36, 45
Answer: (a) 1, 3, 5, 9, 15, 45 (b) 27, 36, 45

4 Pythagoras' theorem

Work out the length of d.
The diagram is not drawn accurately.

Use Pythagoras: $a^2 + b^2 = c^2$, where c is the longest side
$d^2 + 15^2 = 25^2$
$d^2 = 625 - 225 = 400$
$d = \sqrt{400} = 20$
Answer: d = 20 cm

5 Standard form

Write each number in standard form.
(a) 4900
(b) 0.0097

(a) Move the decimal point 3 places: 4.9×10^3
(b) Move the decimal point 3 places the other way: 9.7×10^{-3}
Answer: (a) 4.9×10^3 (b) 9.7×10^{-3}

6 Reflection

The diagram shows triangle ABC on a grid.
(a) Write down the coordinates of the image of B after a reflection in the y-axis.
(b) Write down the coordinates of the image of A after a reflection in the x-axis.

(a) B is at (3, 1). Reflect in the y-axis: (−3, 1)
(b) A is at (4, 4). Reflect in the x-axis: (4, −4)
Answer: (a) (−3, 1) (b) (4, −4)

7 Factorising

Factorise $x^2 - 7x$

Both terms have x as a factor
$x^2 \div x = x$ and $-7x \div x = -7$
Answer: x(x − 7)

Day 120 **B Tier 10-a-day: Model Solutions**

8 Pressure

A block causes a pressure of 3 N/m^2 on the floor.
The area in contact with the floor is 2 m^2.
Work out the force exerted on the floor.

Force = pressure × area
3 × 2 = 6
Answer: 6 N

9 Algebraic proof

Show that (n + 5)(n + 2) − n(n + 7) has the same value for every whole number n.

Expand the first part: $n^2 + 2n + 5n + 10 = n^2 + 7n + 10$
Expand the second part: $n^2 + 7n$
Subtract: the n^2 terms and the n terms cancel, leaving 10
Answer: The value is always 10

10 Tables of values

Complete the table of values for y = 5x − 2

x = −2: y = 5 × (−2) − 2 = −12
x = −1: y = 5 × (−1) − 2 = −7
x = 0: y = 5 × 0 − 2 = −2
Answer: x = −2: −12, x = −1: −7, x = 0: −2