Day 13 **B Tier 10-a-day: Model Solutions**

1 Mean

Here are the masses of some parcels.
6, 2, 7, 7
Work out the mean.

Add the values: 6 + 2 + 7 + 7 = 22
Divide by the number of values: 22 ÷ 4 = 5.5
Answer: 5.5 kg

2 Angles on a line and round a point

The diagram shows 4 angles round a point.
Work out the value of c.
The diagram is not drawn accurately.

Angles round a point add up to 360°
(2c + 35) + (2c + 5) + (2c + 5) + (4c + 5) = 360
10c + 50 = 360
10c = 310
c = 310 ÷ 10 = 31
Answer: c = 31°

3 Equations with unknowns on both sides

Solve 3n + 1 = 2n + 7

Subtract 2n from both sides: n + 1 = 7
Subtract 1 from both sides: 1n = 6
Divide both sides by 1
Answer: n = 6

4 Area of 2D shapes

This is a parallelogram.
Calculate the area of this parallelogram.
The diagram is not drawn accurately.

Area of a parallelogram = base × perpendicular height
The slanting side is not needed
12 × 4 = 48
Answer: 48 mm^2

5 Function notation

$g(x) = 3x^2 - 3$
(a) Work out g(4)
(b) Work out g(−1)

(a) $g(4) = 3 \times 4^2 - 3 = 45$
(b) $g(-1) = 3 \times (-1)^2 - 3 = 0$
Answer: (a) 45 (b) 0

6 Volume of a cylinder

A tin of beans has radius 8 cm and height 20 cm. (Calculator)
Work out its volume.
Give your answer correct to 1 decimal place.

Volume = π × radius^2 × height
$\pi \times 8^2 \times 20 = 4021.239...$
= 4021.2 cm^3 (1 d.p.)
Answer: 4021.2 cm^3

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7 Algebraic fractions

Simplify fully $\frac{6x^2}{3x}$

$6 \div 3 = 2$ and $x^2 \div x = x$

Answer: 2x

8 Grouped frequency tables

The table shows the masses of some parcels.

(a) Write down the modal class.

(b) Work out an estimate for the mean.

(a) The highest frequency is 10

(b) Use the midpoint of each class: 10, 30, 50, 70

Sum of midpoint × frequency = 10 × 7 + 30 × 10 + 50 × 4 + 70 × 4 = 850

Total frequency = 25

Estimate = 850 ÷ 25 = 34

Answer: (a) $20 < m \leq 40$ (b) 34

9 Fraction problems

A paddling pool is $\frac{1}{5}$ full.

56 litres of water are added.

The paddling pool is now $\frac{3}{8}$ full.

Work out the capacity of the paddling pool.

Fraction added = $\frac{3}{8} - \frac{1}{5} = \frac{7}{40}$

$\frac{7}{40}$ of the capacity = 56 litres

$\frac{1}{40}$ of the capacity = 56 ÷ 7 = 8 litres

Whole capacity = 8 × 40 = 320 litres

Answer: 320 litres

10 Bounds

The length of a rectangle is 12 cm and its width is 6 cm.

Both measurements are correct to the nearest cm.

Work out the upper bound for the perimeter of the rectangle.

Upper bound of each side = value + 0.5: 12.5 cm and 6.5 cm

Perimeter = 2 × (12.5 + 6.5) = 38 cm

Answer: 38 cm