Day 158 **B Tier 10-a-day: Model Solutions**

1 Ordering fractions

Write these in order of size.
Start with the smallest.
$\frac{11}{40}$, 90%, $\frac{3}{4}$, $\frac{3}{10}$

Write each as a decimal:
$\frac{11}{40} = 0.275$, $90\% = 0.9$, $\frac{3}{4} = 0.75$, $\frac{3}{10} = 0.3$

Order: $\frac{11}{40}$, $\frac{3}{10}$, $\frac{3}{4}$, 90%

Answer: $\frac{11}{40}$, $\frac{3}{10}$, $\frac{3}{4}$, 90%

2 Enlargement

A rectangle is 8 cm long and 3 cm wide.
It is enlarged by scale factor 4.
(a) Write down the length and width of the enlarged rectangle.
(b) Work out the perimeter of the enlarged rectangle.

(a) $8 \times 4 = 32$ and $3 \times 4 = 12$
(b) Perimeter $= 2 \times (32 + 12) = 88$
Answer: (a) 32 cm by 12 cm (b) 88 cm

3 Best buys

Shampoo is sold in two sizes.
Small: 200 ml for 70p
Large: 300 ml for 87p
Which size is better value for money?
You must show your working.

Compare the cost of 600 ml of each
Small: 3×70p = £2.10
Large: 2×87p = £1.74
The large is cheaper for the same amount
Answer: The large size

4 Equations with fractions

Solve $\frac{5x}{4} + 3 = 38$

Subtract 3 from both sides: $\frac{5x}{4} = 35$

Multiply both sides by 4: $5x = 140$
Divide both sides by 5
Answer: x = 28

5 Pressure

A block exerts a force of 96 newtons on the floor.
The area in contact with the floor is 8 m^2.
Work out the pressure on the floor.
Give your answer in N/m^2.

Pressure = force ÷ area
$96 \div 8 = 12$
Answer: 12 N/m^2

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6 Volume of cuboids

A fish tank is a cuboid 20 cm long, 20 cm wide and 30 cm deep.
(a) Work out the volume of the fish tank.
(b) How many litres of water does it hold when full?
1 litre = 1000 cm^3

(a) Volume = length × width × depth
20 × 20 × 30 = 12000 cm^3
(b) 12000 ÷ 1000 = 12 litres
Answer: (a) 12000 cm^3 (b) 12 litres

7 Speed unit conversion

A motorbike travels at 54 km/h.
Work out its speed in metres per second.

54 km = 54,000 m
1 hour = 3600 seconds
54,000 ÷ 3600 = 15 m/s
Answer: 15 m/s

8 Fraction problems

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

70 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 = 70 litres

$\frac{1}{40}$ of the capacity = 70 ÷ 7 = 10 litres

Whole capacity = 10 × 40 = 400 litres
Answer: 400 litres

9 Equations with fractional answers

Solve $5x - 8 = 16$
Give your answer as a fraction in its simplest form.

Add 8 to both sides: $5x = 24$

Divide both sides by 5: $x = \frac{24}{5}$

Answer: $x = \frac{24}{5}$

10 Perimeter and area of compound shapes

The diagram shows the shape of a garden.
All the corners are right angles. All lengths are in m.
(a) Calculate the perimeter.
(b) Calculate the area.

(a) Missing lengths: 20 − 12 = 8 and 9 − 5 = 4
Perimeter = 20 + 5 + 8 + 4 + 12 + 9 = 58
(b) Split into two rectangles: 20 × 5 = 100 and 12 × 4 = 48
100 + 48 = 148
Answer: (a) 58 m (b) 148 m^2