Day 273 **B Tier 10-a-day: Model Solutions**

1 Solving equations

Solve $7y = 21$

Divide both sides by 7

Answer: $y = 3$

2 Fuel use

A car uses 20 litres of petrol to travel 200 km.
Work out how many kilometres it travels on each litre of petrol.

$200 \div 20 = 10$

Answer: 10 km per litre

3 Exterior angles of polygons

Each interior angle of a regular polygon is 162°.
Work out the number of sides of the polygon.

Exterior angle = $180° - 162° = 18°$
Number of sides = $360 \div 18 = 20$
Answer: 20 sides

4 Multiplying and dividing fractions

Work out

(a) $\frac{3}{5} \times \frac{6}{7}$

(b) $\frac{3}{7} \div \frac{1}{6}$

Give each answer in its simplest form.

(a) Multiply the tops and the bottoms: $\frac{18}{35}$

(b) Turn the second fraction upside down and multiply: $\frac{3}{7} \times 6 = \frac{18}{7} = 2\frac{4}{7}$

Answer: (a) $\frac{18}{35}$ (b) $2\frac{4}{7}$

5 Area of 2D shapes

Find the area of the triangle.
The diagram is not drawn accurately.

Area of a triangle = ½ × base × height
½ × 14 × 10 = 70
Answer: 70 m^2

6 Midpoint of a line segment

M is the midpoint of AB.
A is the point (−7, 7) and M is the point (−6, 6).
Find the coordinates of B.

From A to M, x changes by 1 and y changes by −1
Do the same change again from M to get to B: $x = -6 + 1 = -5$, $y = 6 - 1 = 5$
Answer: (−5, 5)

7 Rates

Electricity costs 20p per unit.
There is also a standing charge of £10.
Work out the total bill for 420 units.

Cost of units: 420 × 20p = 8400p = £84
Add the standing charge: £84 + £10 = £94
Answer: £94

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8 Growth in standard form

There are 5.8×10^3 cells in a sample.
The number doubles every day.
How many are there after 4 days?
Give your answer in standard form.

Each day multiply by 2, so multiply by $2^4 = 16$

$5.8 \times 10^3 \times 16 = 92.8 \times 10^3$

In standard form: 9.28×10^4

Answer: 9.28×10^4

9 Volume of cones and pyramids

A cone has base radius 3 m and vertical height 3 m. (Calculator)

Volume of a cone = $\frac{1}{3}\pi r^2 h$

Work out the volume of the cone.
Give your answer correct to 1 decimal place.

Volume = $\frac{1}{3} \times \pi \times 3^2 \times 3$

= 28.274...

= 28.3 m^3 (1 d.p.)

Answer: 28.3 m^3

10 Reverse repeated percentages

In a sale, the price of a sofa is reduced by 40%. (Calculator)
Two weeks later it is reduced by a further 25% of the new price.
The final price is £112.50.
Work out the original price of the sofa.

Multipliers: 0.6 and 0.75
Overall multiplier = $0.6 \times 0.75 = 0.45$
Original price = £112.50 ÷ 0.45 = £250
Answer: £250