Day 80 **B Tier 10-a-day: Model Solutions**

1 Angles in triangles

The angles in a triangle are x°, 2x° and (x + 60)°.
(a) Work out the value of x.
(b) Work out the size of the largest angle.

(a) x + 2x + x + 60 = 180
4x + 60 = 180
4x = 120, so x = 30
(b) The angles are 30°, 60° and 90°
Answer: (a) x = 30 (b) 90°

2 Fractions of amounts

A shop has 36 T-shirts.
$\frac{2}{3}$ of the T-shirts are blue.
How many are not blue?

$\frac{2}{3}$ of 36 = 36 ÷ 3 × 2 = 24
Not blue: 36 − 24 = 12
Answer: 12

3 Angles in quadrilaterals

WXYZ is an isosceles trapezium with WX parallel to ZY.
Angle ZWX = 67°.
(a) Write down the size of angle WXY.
(b) Work out the size of angle WZY.

(a) In an isosceles trapezium the base angles are equal, so angle WXY = 67°
(b) Co-interior angles add up to 180°
180 − 67 = 113
Answer: (a) 67° (b) 113°

4 Rates

A tap fills a tank at a rate of 12 litres per minute.
The tank holds 96 litres.
How long does it take to fill the empty tank?

Time = 96 ÷ 12 = 8 minutes
Answer: 8 minutes

5 Inequalities on a number line

Write down the inequality shown on the number line. Use x for the variable.

The circle at 0 is filled in, so 0 is included
The line goes to the right, so x is greater than 0
Answer: x ≥ 0

6 Decimal calculations

Work out
(a) 0.08 ÷ 0.04
(b) 20 ÷ 0.5

(a) Multiply both numbers by 100: 8 ÷ 4
8 ÷ 4 = 2
(b) Dividing by 0.5 is the same as multiplying by 2: 20 × 2 = 40
Answer: (a) 2 (b) 40

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7 Speed unit conversion

A cyclist 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 Area of a triangle using sine

In triangle PQR, PQ = 11 m, QR = 12 m and angle PQR = 62°. (Calculator)
Work out the area of the triangle.
Give your answer correct to 1 decimal place.

Area = ½ab sin C
Area = ½ × 11 × 12 × sin 62°
= 58.275...
= 58.3 m^2 (1 d.p.)
Answer: 58.3 m^2

9 Compound interest

£200 is invested for 2 years at 3% compound interest per year. (Calculator)
Work out the total interest earned.

Multiplier = 1.03
Value after 2 years = 200 × 1.03^2 = £212.18
Interest = £212.18 − £200 = £12.18
Answer: £12.18

10 Forming and solving equations

The angles in a triangle are x°, (2x + 28)° and (3x − 10)°.
(a) Work out the value of x.
(b) Work out the size of the largest angle.

(a) The angles add up to 180°: x + (2x + 28) + (3x − 10) = 180
6x + 18 = 180
6x = 162, so x = 27
(b) The angles are 27°, 82° and 71°
Answer: (a) x = 27 (b) 82°