Day 208 **B Tier 10-a-day: Model Solutions**

1 Compound areas

Two rectangles are joined to make a shape.
The first is 14 cm by 5 cm.
The second is 5 cm by 4 cm.
Work out the total area of the shape.

First rectangle: 14 × 5 = 70
Second rectangle: 5 × 4 = 20
70 + 20 = 90
Answer: 90 cm^2

2 Substitution with negative numbers

Work out the value of 2a + 3b
when a = −3 and b = 3

Substitute: 2 × (−3) + 3 × 3
−6 + 9 = 3
Answer: 3

3 Pie charts

In a pie chart showing the answers of 72 people, the angle for netball is 30°.
How many people chose netball?

30° out of 360° = $\frac{1}{12}$

$\frac{1}{12}$ of 72 = 6
Answer: 6

4 Wages and overtime

Kofi is paid £8 per hour for a 35 hour week. (Calculator)
Overtime is paid at double time.
In one week he works 7 hours of overtime.
Work out his total pay for that week.

Normal pay: 35 × £8 = £280
Overtime rate: £8 × 2 = £16 per hour
Overtime pay: 7 × £16 = £112
Total: £280 + £112 = £392
Answer: £392

5 Angles in triangles

A right-angled triangle has one angle of 21°.
Work out the size of the other acute angle.

Angles in a triangle add up to 180°
180 − 90 − 21 = 69
Answer: 69°

6 Cost formulae

A photographer charges £28 plus £6 for each hour of a wedding.
(a) Work out the total cost for 6 hours.
(b) The total cost is £58. Work out the number of hours.

(a) 6 × 6 = 36, then 28 + 36 = 64
(b) Take off the fixed charge: 58 − 28 = 30
Divide by the cost for each: 30 ÷ 6 = 5
Answer: (a) £64 (b) 5

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7 Compound interest

Maya invests £200 in an account paying 10% compound interest per year. (Calculator)
Work out the value of her investment after 3 years.

Multiplier = 1 + 10 ÷ 100 = 1.1

Value = 200×1.1^3
= £266.20

Answer: £266.20

8 Changing the subject

Make q the subject of the formula
$p = 7q - 5$

Add 5 to both sides: $p + 5 = 7q$
Divide both sides by 7

Answer: $\mathbf{q = \frac{p + 5}{7}}$

9 Relative frequency

A spinner has coloured sections. It is spun 400 times and lands on green 60 times.
What is the relative frequency of green?
Give your answer as a decimal.

60 ÷ 400 = 0.15

Answer: 0.15

10 Error intervals

The time of a race is 54.8 seconds, correct to 1 decimal place.
Write down the error interval for the time.
Use the letter t.

The rounding unit is 0.1, so half of it is 0.05
Lower bound = 54.8 − 0.05 = 54.75
Upper bound = 54.8 + 0.05 = 54.85

Answer: $\mathbf{54.75 \leq t < 54.85}$