Day 144 **B Tier 10-a-day: Model Solutions**

1 Missing value from a mean

The mean of 5 numbers is 26.
Four of the numbers are 21, 31, 25, 27.
Work out the fifth number.

Total = 5 × 26 = 130
Given total = 104
Fifth = 130 − 104 = 26
Answer: 26

2 Symmetry

How many lines of symmetry does a parallelogram have?

A parallelogram has no lines of symmetry
Answer: 0

3 Factors and multiples

Write down all the common factors of 20 and 28.

Factors of 20: 1, 2, 4, 5, 10, 20
Factors of 28: 1, 2, 4, 7, 14, 28
The common factors are the numbers in both lists
Answer: 1, 2, 4

4 Solving double inequalities

(a) Solve $1 < 3x - 5 < 10$
(b) Write down the integer values of x that satisfy this inequality.

(a) Add 5 in all three parts: $6 < 3x < 15$
Divide all three parts by 3: $2 < x < 5$
(b) The whole numbers in this range are 3, 4
Answer: (a) $2 < x < 5$ (b) 3, 4

5 Using a given calculation

Use the fact that 22 × 26 = 572
to work out
(a) 2200 × 2.6
(b) 5720 ÷ 2.2

(a) 2200 = 22 × 100 and 2.6 = 26 ÷ 10
So the answer is 572 × 10 = 5720
(b) 5720 = 572 × 10 and 2.2 = 22 ÷ 10
572 ÷ 22 = 26, so the answer is 26 × 100 = 2600
Answer: (a) 5720 (b) 2600

6 Population density

City E has a population of 1,800.
Its area is 30 km^2.
Work out the population density.
Give your answer in people per km^2.

Population density = population ÷ area
1,800 ÷ 30 = 60
Answer: 60 people per km^2

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7 Equation of a line

Line L has equation $y = -x + 6$
Line M is parallel to line L and passes through the point $(-4, 3)$.
Find the equation of line M.

Parallel lines have the same gradient, so line M is $y = -1x + c$
Substitute $x = -4$ and $y = 3$: $3 = -1 \times (-4) + c$
$c = 3 - 4 = -1$
Answer: $y = -x - 1$

8 Perimeter and area of compound shapes

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

(a) Missing lengths: $19 - 16 = 3$ and $11 - 7 = 4$
Perimeter = $19 + 7 + 3 + 4 + 16 + 11 = 60$
(b) Split into two rectangles: $19 \times 7 = 133$ and $16 \times 4 = 64$
$133 + 64 = 197$
Answer: (a) 60 cm (b) 197 cm^2

9 Venn diagrams

The Venn diagram shows information about 27 students in a class.
One of them is chosen at random.
Find the probability that the person chose neither Tennis nor Swimming.

Outside both circles = 4
Total = 27
P = 4 out of 27
Answer: $\frac{4}{27}$

10 Multiplying and dividing fractions

Work out
(a) $\frac{5}{8} \times \frac{4}{5}$
(b) $\frac{8}{9} \div \frac{7}{8}$
Give each answer in its simplest form.

(a) Multiply the tops and the bottoms: $\frac{20}{40} = \frac{1}{2}$

(b) Turn the second fraction upside down and multiply: $\frac{8}{9} \times \frac{8}{7} = \frac{64}{63} = 1\frac{1}{63}$

Answer: (a) $\frac{1}{2}$ (b) $1\frac{1}{63}$