Day 176 **C Tier 10-a-day: Model Solutions**

1 Halves, quarters and thirds

Write down a third of 54.

54 ÷ 3 = 18

Answer: 18

2 Radius and diameter

The radius of a plate is 11 cm.
Work out the diameter.

The diameter is twice the radius
2 × 11 = 22

Answer: 22 cm

3 Function machines

Here is a function machine.
The output is 15.
Work out the input.

Work backwards using the opposite operations
15 + 13 = 28
28 ÷ 4 = 7

Answer: 7

4 Angles in parallel lines

Two parallel lines are crossed by a straight line.
Work out the size of angle p.
Give a reason for your answer.

The angles are on opposite sides of the transversal between the parallel lines, so they are alternate angles
Alternate angles are equal
p = 120°

Answer: p = 120° (alternate angles)

5 The median of an even number of values

Here are the marks in a test.
16 9 4 15 8 15 13 4
Work out the median.

Put the numbers in order: 4 4 8 9 13 15 15 16
The middle two numbers are 9 and 13
Halfway between them: (9 + 13) ÷ 2 = 11

Answer: 11

6 Adding fractions

Work out $\frac{3}{7} + \frac{1}{7}$.

The denominators are the same, so add the numerators
3 + 1 = 4

Answer: $\frac{4}{7}$

7 Map scales

On a map, 1 cm represents 10 km.
Two towns are 40 km apart in real life.
How far apart are they on the map?

40 ÷ 10 = 4

Answer: 4 cm

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8 Enlargement

A square has sides of length 5 cm.
It is enlarged by scale factor 2.
Work out the length of a side of the enlarged square.

Multiply the side by the scale factor
5 × 2 = 10
Answer: 10 cm

9 Probability of not getting a colour

A bag contains 8 black sweets, 6 yellow sweets and 6 blue sweets.
One is taken at random.
Write down the probability that it is not blue.

Number that are not blue: 8 + 6 = 14
Total: 20
Probability = $\frac{14}{20} = \frac{7}{10}$

Answer: $\frac{7}{10}$

10 Forming and solving equations

There are x children in a club.
9 children leave.
There are now 15 children in the club.
(a) Write down an equation using x.
(b) Solve your equation to find how many children were in the club at first.

(a) $x - 9 = 15$
(b) $x = 15 + 9 = 24$
Answer: (a) $x - 9 = 15$ (b) $x = 24$