**Day 37** **B Tier 10-a-day: Model Solutions**

## 1 Faces, edges and vertices

Write down the number of faces and edges of a triangular-based pyramid.

Faces: a 3-sided base and 3 triangles = 4
Edges: 3 on the base plus 3 up to the point = 6
**Answer: faces: 4 edges: 6**

## 2 Quadratic graphs

The diagram shows the graph of
$y = x^2 - 8x + 12$
(a) Write down the solutions of $x^2 - 8x + 12 = 0$
(b) Write down the coordinates of the minimum point of the graph.

(a) The solutions are where the graph crosses the x-axis
(b) The lowest point of the curve is halfway between the two solutions, at x = 4
**Answer: (a) x = 2 and x = 6 (b) (4, −4)**

## 3 Scale drawings and maps

The scale of a map is 1 : 5000.
Two bridges are 8 cm apart on the map.
Work out the real distance between them.
Give your answer in metres.

Real distance = 8 × 5000 = 40 000 cm
100 cm = 1 m, so divide by 100: 400 m
**Answer: 400 m**

## 4 Equations with brackets

Solve 4(2x + 2) = 80

Divide both sides by 4: 2x + 2 = 20
Subtract 2 from both sides: 2x = 18
Divide both sides by 2
**Answer: x = 9**

## 5 Two-way tables

The table shows some information about 64 members of a leisure centre.
One person from the group "Children" is chosen at random.
Find the probability that this person chose "Swim".

Children total = 64 − 32 = 32
Children who chose Swim = 32 − 27 = 5
P = 5 out of 32
**Answer:** $\frac{5}{32}$

## 6 Ordering fractions

Write these in order of size.
Start with the smallest.

75%, 0.25, 56%, $\frac{3}{10}$

Write each as a decimal:

75% = 0.75, 0.25 = 0.25, 56% = 0.56, $\frac{3}{10}$ = 0.3

Order: 0.25, $\frac{3}{10}$, 56%, 75%

**Answer: 0.25,** $\frac{3}{10}$**, 56%, 75%**

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## 7 Angles and algebra

The four angles of a quadrilateral are x°, (x + 15)°, 2x° and (2x + 3)°.
Work out the size of the largest angle.

Angles in a quadrilateral add up to 360°
x + (x + 15) + 2x + (2x + 3) = 360
6x + 18 = 360
6x = 342, so x = 57
The angles are 57°, 72°, 114°, 117°
**Answer: 117°**

## 8 Grouped frequency tables

The table shows the lengths of some leaves.
(a) Write down the modal class.
(b) Work out an estimate for the mean.

(a) The highest frequency is 10
(b) Use the midpoint of each class: 20, 40, 60, 80
Sum of midpoint × frequency = 20 × 4 + 40 × 10 + 60 × 5 + 80 × 6 = 1260
Total frequency = 25
Estimate = 1260 ÷ 25 = 50.4
**Answer: (a) $30 < l \leq 50$ (b) 50.4**

## 9 Similar shapes

The two triangles are similar.
(a) Write down the scale factor of the enlargement from the smaller triangle to the larger triangle.
(b) Work out the value of t.
The diagram is not drawn accurately.

(a) Scale factor = 20 ÷ 10 = 2
(b) t = 6 × 2 = 12
**Answer: (a) 2 (b) t = 12 cm**

## 10 Error intervals

The number x is rounded to the nearest 10.
The result is 550.
Write down the error interval for x.

The rounding unit is 10, so x can be up to half of this, 5, either side of 550
Lower bound = 550 − 5 = 545 and upper bound = 550 + 5 = 555
**Answer: $545 \leq x < 555$**