Day 153 **B Tier 10-a-day: Model Solutions**

1 Ordering decimals

Write these numbers in order of size.
Start with the smallest number.
5.2, 5.33, 5.227, 5.22

Write each number to 3 decimal places:
5.200, 5.330, 5.227, 5.220
Now put them in order: 5.200, 5.220, 5.227, 5.330
Answer: 5.2, 5.22, 5.227, 5.33

2 Continuing sequences

Here are the first four terms of a sequence.
6, 9, 14, 21
(a) Write down the next two terms.
(b) Describe the rule for continuing the sequence.

The differences are 3, 5, 7, going up by 2 each time
Next differences: 9 then 11
21 + 9 = 30 and 30 + 11 = 41
Answer: (a) 30, 41 (b) The differences go up by 2 each time

3 Enlargement

A rectangle is 3 cm long and 8 cm wide.
It is enlarged by scale factor 3.
(a) Write down the length and width of the enlarged rectangle.
(b) Work out the perimeter of the enlarged rectangle.

(a) 3 × 3 = 9 and 8 × 3 = 24
(b) Perimeter = 2 × (9 + 24) = 66
Answer: (a) 9 cm by 24 cm (b) 66 cm

4 Place value

Here are four digit cards.
4 5 6 2
Use all four cards to make the largest possible even number.

The last digit must be even. Put the biggest remaining digits first.
The largest even number is 6542
Answer: 6542

5 Term-to-term rules

The first term of a sequence is 1.
The term-to-term rule is: double the term, then add 1.
Work out the 5th term.

2nd term: 2 × 1 + 1 = 3
3rd term: 2 × 3 + 1 = 7
4th term: 2 × 7 + 1 = 15
5th term: 2 × 15 + 1 = 31
Answer: 31

6 Pythagoras' theorem

Calculate the length of q.
The diagram is not drawn accurately.

Use Pythagoras: $a^2 + b^2 = c^2$
$q^2 = 12^2 + 35^2 = 144 + 1225 = 1369$
$q = \sqrt{1369} = 37$
Answer: q = 37 cm

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7 Compound interest

£2,500 is invested for 2 years at 2% compound interest per year. (Calculator)
Work out the total interest earned.

Multiplier = 1.02

Value after 2 years = $2{,}500 \times 1.02^2 = £2{,}601$
Interest = £2,601 − £2,500 = £101
Answer: £101

8 Isosceles triangles and Pythagoras

Triangle ABC is isosceles with AB = AC = 5 m.
The base BC = 8 m.
(a) Work out the perpendicular height of the triangle.
(b) Work out the area of the triangle.

(a) The height splits the base in half: 8 ÷ 2 = 4
$h^2 = 5^2 - 4^2 = 25 - 16 = 9$, so h = 3
(b) Area = ½ × 8 × 3 = 12
Answer: (a) 3 m (b) 12 m^2

9 Cumulative frequency

The cumulative frequency graph shows the times taken by 40 students to complete a puzzle.
(a) Use the graph to estimate the median.
(b) Work out an estimate for the interquartile range.

(a) Median is at 40 ÷ 2 = 20: read across from 20 on the vertical axis to the curve, then down: 107
(b) Lower quartile at 10: 80. Upper quartile at 30: 117
IQR = 117 − 80 = 37
Answer: (a) 107 minutes (b) 37 minutes

10 Unitary method

3 apples cost £1.65.
Work out the cost of 5 apples.

1 apple costs £1.65 ÷ 3 = 55p
5 apples cost 5 × 55p = £2.75
Answer: £2.75