Day 133 **B Tier 10-a-day: Model Solutions**

1 Continuing sequences

Here are the first four terms of a sequence.
32, 30, 28, 26
(a) Write down the next two terms.
(b) Describe the rule for continuing the sequence.

Each term is 2 less than the one before
26 − 2 = 24 and 24 − 2 = 22
Answer: (a) 24, 22 (b) Subtract 2 each time

2 HCF and LCM

Find the (a) highest common factor (HCF), (b) lowest common multiple (LCM) of 8 and 12.

$8 = 2^3$ and $12 = 2^2 \times 3$
(a) HCF: multiply the primes in both lists, using the smaller power: $2^2 = 4$
(b) LCM: use the larger power of every prime: $2^3 \times 3 = 24$
Answer: (a) 4 (b) 24

3 Faces, edges and vertices

Write down the number of faces and edges of a cuboid.

Faces: top, bottom and 4 sides = 6
Edges: 4 on the top, 4 on the bottom and 4 joining them = 12
Answer: faces: 6 edges: 12

4 Forming expressions

Jo has x books.
Ben has 2 more books than Jo.
Cara has 4 times as many books as Jo.
(a) Write an expression, in terms of x, for the number of books Ben has.
(b) Write an expression, in terms of x, for the total number of books the three of them have. Give your answer in its simplest form.

(a) Ben has 2 more than Jo: x + 2
(b) Cara has 4x
Total = x + (x + 2) + 4x
Collect like terms: 6x + 2
Answer: (a) x + 2 (b) 6x + 2

5 Surface area of cuboids

An open box (no lid) is a cuboid measuring 4 cm by 8 cm by 3 cm.
The base is 4 cm by 8 cm.
Work out the total area of card needed to make the box.

Base: 4 × 8 = 32
Two long sides: 2 × 4 × 3 = 24
Two short sides: 2 × 8 × 3 = 48
32 + 24 + 48 = 104
Answer: 104 cm^2

6 Distance-time graphs

The graph shows Omar's journey.
(a) How far did Omar travel in the first 60 minutes?
(b) Work out Omar's speed in the last 60 minutes. Give your answer in km/h.

(a) Read from the graph at 60 minutes: 12 km
(b) In the last section the distance changes by 12 km in 60 minutes
12 ÷ 1 = 12 km/h
Answer: (a) 12 km (b) 12 km/h

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7 Rounding

Write 1294.3148
(a) correct to 1 decimal place,
(b) correct to 2 significant figures.

(a) Look at the next digit after the first decimal place: 1
So 1294.3148 rounds to 1294.3
(b) The first significant figure is the first non-zero digit. Count 2 figures and look at the next digit.
1294.3148 rounds to 1300
Answer: (a) 1294.3 (b) 1300

8 Currency conversion

£1 = 1.1 dollars
A holiday costs $44.
Work out the cost in pounds.

Divide by the rate: 44 ÷ 1.1
= £40
Answer: £40

9 Congruent triangles

Triangle ABC has angles of 35° and 80°, and a side of 7 mm between them.
Triangle XYZ has angles of 80° and 35°, and a side of 7 mm between them.
Are the two triangles congruent?
Give a reason for your answer.

Two pairs of equal angles, with the same side between them
So the triangles are congruent (ASA)
Answer: Yes, ASA (two angles and the included side)

10 Comparing fractions and percentages

Leah has $\frac{4}{5}$ of £40.

Priya has 25% of £80.
Who has more money? You must show your working.

Leah: 40 ÷ 5 × 4 = £32
Priya: 80 ÷ 100 × 25 = £20
£32 is more than £20, so Leah has more
Answer: Leah