Day 19 **B Tier 10-a-day: Model Solutions**

1 Inequalities on a number line

(a) Write down the inequality shown on the number line.
(b) Write down all the integers that satisfy the inequality.

(a) The circle at -1 is open and the circle at 2 is filled in
$-1 < x \leq 2$
(b) The whole numbers on the shaded part: 0, 1, 2
Answer: (a) $-1 < x \leq 2$ (b) 0, 1, 2

2 Angles in parallel lines

In the diagram, KL is parallel to MN.
(a) Work out the size of angle a.
(b) Give a reason for your answer.
The diagram is not drawn accurately.

Angle a and the 109° angle are corresponding angles (F shape)
a = 109°
Corresponding angles are equal
Answer: (a) a = 109° (b) Corresponding angles are equal

3 Metric units

A jug holds 2 litres of juice.
Each glass holds 200 ml.
How many glasses can be filled from the jug?

2 litres = 2 × 1000 = 2000 ml
2000 ÷ 200 = 10
Answer: 10 glasses

4 Scale drawings and maps

The scale of a map is 1 : 10 000.
Two villages are 3.5 cm apart on the map.
Work out the real distance between them.
Give your answer in metres.

Real distance = 3.5 × 10 000 = 35 000 cm
100 cm = 1 m, so divide by 100: 350 m
Answer: 350 m

5 Solving inequalities

Solve $4n + 9 \leq 41$

Subtract 9 from both sides: $4n \leq 32$
Divide both sides by 4 (a positive number, so the inequality sign stays the same)
Answer: $n \leq 8$

6 Surface area of a cylinder

A cylinder has radius 5 cm and height 8 cm. (Calculator)
It is closed.
Work out the total outside surface area.
Give your answer correct to 1 decimal place.

Two circles: $2 \times \pi \times 5^2 = 50\pi$
Curved surface: $2 \times \pi \times 5 \times 8 = 80\pi$
Total = $50\pi + 80\pi = 130\pi$
= 408.4 cm^2 (1 d.p.)
Answer: 408.4 cm^2

Day 19 **B Tier 10-a-day: Model Solutions**

7 Best buys

Cereal is sold in two sizes.
Small: 250 g for £1.42
Large: 750 g for £3.90
Which size is better value for money?
You must show your working.

Compare the cost of 750 g of each
Large: 1 × £3.90 = £3.90
Small: 3 × £1.42 = £4.26
The large is cheaper for the same amount
Answer: The large size

8 Growth in standard form

There are 8×10^4 cells in a sample.
The number triples every day.
How many are there after 5 days?
Give your answer in standard form.

Each day multiply by 3, so multiply by $3^5 = 243$
$8 \times 10^4 \times 243 = 1944 \times 10^4$
In standard form: 1.944×10^7
Answer: 1.944×10^7

9 Solving quadratic equations

Solve $x^2 - 36 = 0$

Factorise as a difference of two squares: $(x - 6)(x + 6) = 0$
Either $x - 6 = 0$ or $x + 6 = 0$
Answer: $x = -6$ or $x = 6$

10 Pressure

A box exerts a force of 150 N and causes a pressure of 15 N/m^2.
Work out the area in contact with the ground.

Area = force ÷ pressure
150 ÷ 15 = 10
Answer: 10 m^2