Day 313 **B Tier 10-a-day: Model Solutions**

1 Rounding

Write 33.5542
(a) correct to 2 decimal places,
(b) correct to 3 significant figures.

(a) Look at the next digit after the second decimal place: 4
So 33.5542 rounds to 33.55
(b) The first significant figure is the first non-zero digit. Count 3 figures and look at the next digit.
33.5542 rounds to 33.6
Answer: (a) 33.55 (b) 33.6

2 Enlargement

A rectangle is 12 cm long and 2 cm wide.
It is enlarged by scale factor 1.5.
(a) Write down the length and width of the enlarged rectangle.
(b) Work out the perimeter of the enlarged rectangle.

(a) 12 × 1.5 = 18 and 2 × 1.5 = 3
(b) Perimeter = 2 × (18 + 3) = 42
Answer: (a) 18 cm by 3 cm (b) 42 cm

3 Comparing fractions and percentages

Priya has $\frac{1}{8}$ of £88.

Nina has 30% of £60.
Who has more money? You must show your working.

Priya: 88 ÷ 8 × 1 = £11
Nina: 60 ÷ 100 × 30 = £18
£18 is more than £11, so Nina has more
Answer: Nina

4 Equations with brackets

Solve 6(2x + 4) = 60

Divide both sides by 6: 2x + 4 = 10
Subtract 4 from both sides: 2x = 6
Divide both sides by 2
Answer: x = 3

5 Percentages of amounts

Work out
(a) 45% of £120
(b) 40% of 40

(a) 10% of £120 = £12
5% of £120 = £6
45% = 4 × £12 + £6 = £54
(b) 10% of 40 = 4
40% = 4 × 4 = 16
Answer: (a) £54 (b) 16

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6 Venn diagram problems

30 viewers were asked.
20 of them watch drama and 13 of them watch comedy.
6 of them did both.
(a) How many did neither?
(b) One is chosen at random. Find the probability that they watch drama but do not watch comedy.

(a) Union = 20 + 13 − 6 = 27
Neither = 30 − 27 = 3
(b) Only watch drama = 20 − 6 = 14
P = 14 out of 30

Answer: (a) 3 (b) $\frac{7}{15}$

7 Solving quadratic equations

Solve $x^2 + 12x + 32 = 0$

Factorise: (x + 4)(x + 8) = 0
Either x + 4 = 0 or x + 8 = 0
Answer: x = −8 or x = −4

8 Compound interest

£5,000 is invested for 2 years at 3% compound interest per year. (Calculator)
Work out the total interest earned.

Multiplier = 1.03
Value after 2 years = $5{,}000 \times 1.03^2$ = £5,304.50
Interest = £5,304.50 − £5,000 = £304.50
Answer: £304.50

9 Radius from area or circumference

The circumference of a circle is 28π cm.
Work out the radius of the circle.

Circumference = 2πr, so 2r = 28
r = 28 ÷ 2 = 14
Answer: 14 cm

10 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: 64.5
(b) Lower quartile at 10: 55. Upper quartile at 30: 69.5
IQR = 69.5 − 55 = 14.5
Answer: (a) 64.5 minutes (b) 14.5 minutes