Day 264 **S Tier 10-a-day**

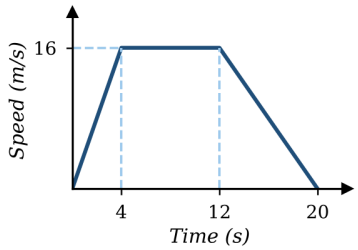
1 Evan puts £20,000 in a savings account.
Compound interest is paid at 3% in year 1, 1% in year 2 and 3% in year 3.
Work out the amount in the account at the end of year 3.
Give your answer to the nearest penny.
(Calculator)

2 The table shows the number of students in each of four groups.
(a) A stratified sample of 21 is taken. Work out how many come from Year 8.
(b) A different stratified sample has 14 from Year 10. Work out the size of this sample.

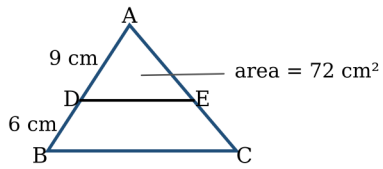
	Year 7	Year 8	Year 9	Year 10
Number	40	30	70	70

3 A sector of a circle has angle 135° and area 24π cm^2.
(a) Work out the radius of the circle.
(b) Work out the length of the arc of the sector.
Give your answer to (b) in terms of π.

4 The graph shows the speed of a train between two stations.
(a) Work out the acceleration in the first 4 seconds.
(b) Work out the total distance.



5 $\mathbf{a} = \begin{pmatrix} -3 \\ 1 \end{pmatrix}$, $\mathbf{b} = \begin{pmatrix} -4 \\ 0 \end{pmatrix}$ and $\mathbf{c} = \begin{pmatrix} 4 \\ 1 \end{pmatrix}$
$\mathbf{a} + k\mathbf{b}$ is parallel to $\mathbf{c}$.
Work out the value of k.

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6 The curve $y = x^2 + 6x - 16$ crosses the x-axis at the points A and B. (a) Find the coordinates of A and B. (b) Find the coordinates of the minimum point of the curve.	
7 A train travels a distance of 110 km, correct to the nearest 5. The journey takes 9.6 hours, correct to 2 significant figures. Work out the upper bound of the speed. Give your answer correct to 3 significant figures. (Calculator)	
8 In the diagram, DE is parallel to BC. AD = 9 cm, DB = 6 cm and the area of triangle ADE is 72 cm^2. Work out the area of the trapezium DBCE. The diagram is not drawn accurately. 	
9 Show that $(5 + 2\sqrt{7})(5 - 2\sqrt{7})$ is an integer.	
10 A bag contains some beads. 3 of them are blue and the rest are black. Two beads are taken at random without replacement. The probability that both are blue is $\frac{1}{5}$. Work out how many beads are black.	