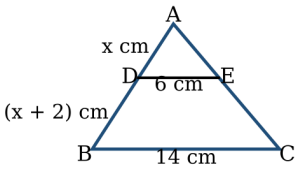
Day 176 **S Tier 10-a-day**

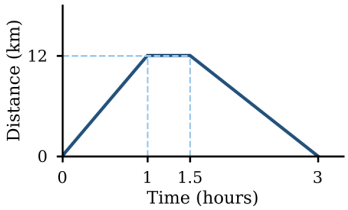
1 In the diagram, DE is parallel to BC.
AD = x cm, DB = (x + 2) cm, DE = 6 cm and BC = 14 cm.
(a) Find the value of x.
(b) Work out the length of AB.
The diagram is not drawn accurately.



2 30 deer in a forest are caught, marked and put back.
Later, a second sample of 40 deer is caught. 5 of these are marked.
(a) Work out an estimate for the number of deer in a forest.
(b) State one assumption you have made.

3 Work out $(3.6 \times 10^2)^3$
Give your answer in standard form.

4 The graph shows Maya's cycle ride to a café and back.
(a) Work out Maya's speed on the way back.
(b) Work out Maya's average speed for the whole ride, including the stop.



5 A is the point (−3, −4) and B is the point (3, 4).
Find an equation of the perpendicular bisector of AB. Give your answer in the form ax + by = c, where a, b and c are integers.

Day 176	S Tier 10-a-day
6 Fatima invests £8,500. The rates of interest for the next 3 years are 2%, 3% and 6%. Compound interest is paid. Work out the value of the investment after 3 years. Give your answer to the nearest penny. (Calculator)	
7 The 2nd term of a geometric sequence is 24. The 4th term of the sequence is 54. All the terms of the sequence are positive. (a) Work out the common ratio. (b) Work out the first term.	
8 A retailer buys a bike and adds a 50% mark-up to get the selling price. In a sale the selling price is reduced by 25% to £427.50. Work out how much the shop paid for a bike.	
9 OA = $\mathbf{a}$ and OB = $\mathbf{b}$. OP = $\mathbf{a} + 5\mathbf{b}$, OQ = $4\mathbf{a} + 11\mathbf{b}$ and OR = $8\mathbf{a} + 19\mathbf{b}$. (a) Show that P, Q and R lie on a straight line. (b) Work out the ratio PQ : QR in its simplest form.	
10 A and B are the points (0, 3) and (−8, −9). AB is a diameter of a circle. Find an equation of the circle.	