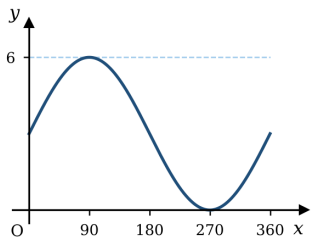
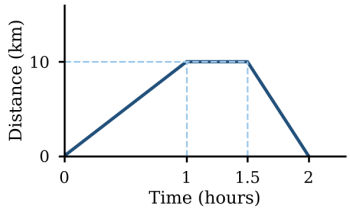
Day 143	S Tier 10-a-day
1 Solve $\frac{x-2}{6} + \frac{x-1}{8} = 1$	
2 OA = $\mathbf{a}$ and OB = $\mathbf{b}$. OP = 0, OQ = $12\mathbf{a} - 9\mathbf{b}$ and OR = $28\mathbf{a} - 21\mathbf{b}$. (a) Show that P, Q and R lie on a straight line. (b) Work out the ratio PQ : QR in its simplest form.	
3 The mass of one coin is 1.25×10^{-2} g. A box of coins has a total mass of 7.875×10^{5} g. Work out how many there are in the box. Give your answer in standard form.	
4 The diagram shows the graph of y = a sin x + c. (a) Write down the value of a and the value of c. (b) Work out the value of y when x = 210°. 	
5 The point P(−6, −4) lies on the graph of y = f(x). Write down the coordinates of the image of P on the graph of (a) y = f(2x) (b) y = 2f(x)	

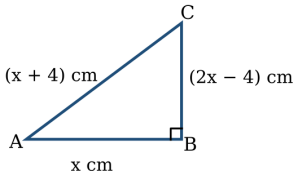
Day 143 **S Tier 10-a-day**

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



7 a = 9.5 and b = 4.1,
both correct to 1 decimal place.
Work out the lower bound of a + b.

8 ABC is a right-angled triangle with sides (x) cm, (2x − 4) cm and (x + 4) cm. The longest side is (x + 4) cm.
(a) Find the value of x.
(b) Work out the area of the triangle.
The diagram is not drawn accurately.



9 A population is decreased by x% in one year and then decreased by a further x% the next year.
Over the two years the population decreases by 9.75%.
Work out the value of x.

10 The volume of a cube is directly proportional to the cube of the length of its edge.
The length of its edge is increased by 50%.
Work out the percentage change in the volume of a cube.