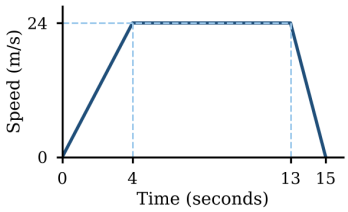
Day 201	IGCSE 10-a-day
1 Oscar and Callum live 270 km apart. At 10:00 they set off towards each other on the same road. Oscar drives at 75 km/h and Callum drives at 60 km/h. (a) At what time do they meet? (b) How far from Oscar's home do they meet?	
2 $f(x) = -2x^2 + 8x + 12$ Use differentiation to find the coordinates of the turning point of the graph of $y = f(x)$. State whether it is a maximum or a minimum.	
3 (a) Write $x^2 + 12x + 38$ in the form $(x + p)^2 + q$ (b) Write down the coordinates of the turning point of the curve $y = x^2 + 12x + 38$	
4 The graph shows the speed of a cyclist during 15 seconds. (a) Work out the acceleration during the first 4 seconds. (b) Work out the average speed over the whole 15 seconds. 	
5 The radius of a circle is decreased by 50%. Work out the percentage change in the area of the circle.	

Day 201 **IGCSE 10-a-day**

6 $f(x) = \frac{x - 5}{4}$ and $g(x) = x^2 + 4x + 4$.

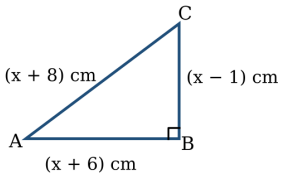
Solve $f^{-1}(x) = g(x)$.

7 ABC is a right-angled triangle with sides $(x + 6)$ cm, $(x - 1)$ cm and $(x + 8)$ cm. The longest side is $(x + 8)$ cm.

(a) Find the value of x.

(b) Work out the area of the triangle.

The diagram is not drawn accurately.



8 $y = x^3 - 3x^2 + 5$

(a) Show that there is a stationary point at $x = 2$.

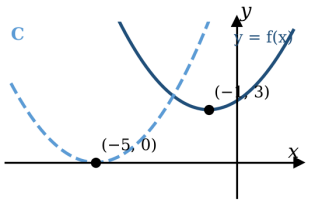
(b) By finding the gradient when $x = \frac{3}{2}$ and when $x = \frac{5}{2}$, decide whether it is a maximum or a minimum.

9 The diagram shows the graph of $y = f(x)$ with a minimum point at $(-1, 3)$.

The dashed curve C is the image of $y = f(x)$ after a translation.

The minimum point of C is $(-5, 0)$.

Write down the equation of C in terms of f.



10 A particle moves in a straight line. Its velocity, v m/s, at time t seconds is given by

$v = 12t - 2t^2$ for $0 \leq t \leq 6$

Find the time at which the speed of the particle is greatest, and this greatest speed.