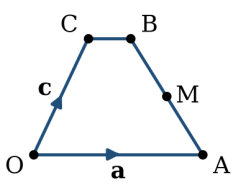
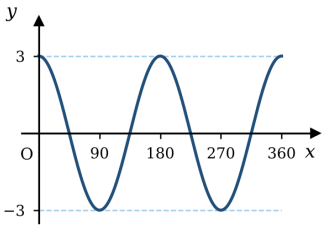
Day 314	IGCSE 10-a-day
1 A particle P moves in a straight line. After t seconds its displacement from a fixed point O is s metres, where $s = 2t^3 - 6t^2 + 3t + 5$ $(t > 0)$ Find (a) the velocity of P, (b) the acceleration of P, when t = 3.	
2 Show that $\sqrt{6 + 2\sqrt{5}} = 1 + \sqrt{5}$	
3 The population of a town is decreased by 30%. The new amount is then decreased by 50%. Work out the overall percentage change.	
4 A curve has equation $y = (x - 1)(x + 1)(x + 2)$. Work out the gradient of the curve at each point where it crosses the x-axis.	
5 OABC is a trapezium. OA is parallel to CB and CB = $\frac{1}{4}$OA. **OA** = **a** and **OC** = **c**. (a) Find **AB** in terms of **a** and **c**. (b) AM : MB = 1 : 1. Find **OM**. 	

Day 314	IGCSE 10-a-day
6 A curve has equation $y = x^3 + x^2 + 4x + 2$. Show that y is an increasing function for all values of x.	
7 The graph of y = f(x) has a minimum point at (1, −5). Write down the coordinates of the turning point of the graph of (a) y = f(−x) (b) y = f(x − 3) − 3	
8 63 students were asked which activities they do. A: study Art B: study Music C: study Drama n(A) = 34, n(B) = 31, n(C) = 24, n(A ∩ B) = 11, n(A ∩ C) = 14, n(B ∩ C) = 12, n(A ∩ B ∩ C) = 5. (a) Work out how many are in none of A, B and C. (b) Work out how many are in exactly one of A, B and C.	
9 The diagram shows the graph of y = a cos bx, where a and b are positive integers. (a) Write down the value of a and the value of b. (b) Work out the value of y when x = 210°. 	
10 Show that the line y = x + 4 is a tangent to the circle $x^2 + y^2 = 8$. Find the coordinates of the point where the line touches the circle.	