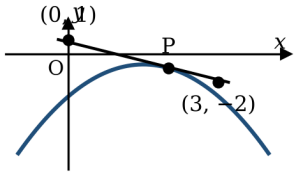
Day 231	IGCSE 10-a-day
1 Find $\frac{dy}{dx}$ when $y = x^5 - 3x^3 - 7$	
2 Simplify fully $\frac{5x^2 - 20}{x^2 + 5x - 14}$	
3 $x : y = 4 : 3$ Work out the ratio $(5x - 6y) : (3x + 6y)$ Give your answer in its simplest form.	
4 The diagram shows part of the curve $y = -x^2 + 3x - 3$. The line shown is the tangent to the curve at the point P. (Not drawn accurately.) (a) Use the two marked points on the tangent to work out its gradient. (b) Use differentiation to find the x coordinate of P. 	
5 Work out $(4.2 \times 10^4)^2$ Give your answer in standard form.	

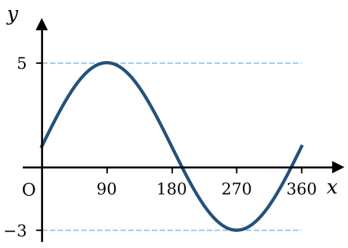
Day 231 **IGCSE 10-a-day**

6 A curve has equation $y = (x + 3)(x + 3)(x - 1)$.
Find the equation of the tangent to the curve at the point where $x = -1$.

7 A machine was bought for £4,900.
Each year its value decreases by the same percentage.
After 2 years it is worth £2,401.
Work out the percentage decrease each year.

8 x and y satisfy these inequalities:
$x \geq 2$, $y \geq 2$, $x + y \leq 9$
Find the greatest possible value of $5x + 3y$.

9 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 $x = 330°$.



10 $\mathbf{OA} = \mathbf{a}$, $\mathbf{OB} = \mathbf{b}$, $\mathbf{OP} = \frac{1}{3}\mathbf{a}$ and $\mathbf{OQ} = \frac{1}{4}\mathbf{b}$.
AQ and BP meet at X.
(a) Find $\mathbf{OX}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.
(b) Find the ratio AX : XQ.

