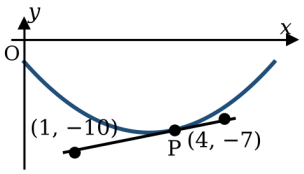
Day 97	IGCSE 10-a-day

1 The diagram shows part of the curve $y = x^2 - 5x - 2$. 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.



2 The height of a tower is 5400 m, correct to the nearest 100.
Write down the error interval for the height of a tower, using h.

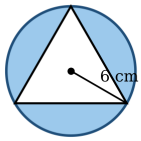
3 Sparkle Cleaners has a call-out fee of £7 plus £3 per hour.
Fresh Start has a call-out fee of £17.50 plus £1.50 per hour.
(a) Work out the number of hours for which the two costs are the same.
(b) Which is cheaper for 16 hours, and by how much?

4 Shape S has area 8 cm^2.
S is transformed by the matrix $\begin{pmatrix} k & 3 \\ 3 & 5 \end{pmatrix}$ and the image has area 88 cm^2.
Find the two possible values of k.

5 The curve $y = x^2 + x + 3$ and the line $y = -4x - 3$ intersect at two points A and B, where A has the smaller x coordinate.
(a) Find the coordinates of A and B.
(b) Find the gradient of the curve at A and at B.

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6 The diagram shows an equilateral triangle inside a circle of radius 6 cm.
The three vertices of the triangle lie on the circle.
Work out the area of the shaded region. Give your answer in the form $a\pi - b\sqrt{3}$.



7 The normal to the curve $y = -x^2 - 5x + 2$ at the point where $x = -2$ meets the x-axis at N.
Find the coordinates of N.

8 OA = $\mathbf{a}$ and OB = $\mathbf{b}$.
OP = $5\mathbf{a} - 2\mathbf{b}$, OQ = $7\mathbf{a} + 8\mathbf{b}$ and OR = $10\mathbf{a} + 23\mathbf{b}$.
(a) Show that P, Q and R lie on a straight line.
(b) Work out the ratio PQ : QR in its simplest form.

9 p = 11.1 and r = 8.5, each correct to 1 decimal place.
q = 3.15, correct to 2 decimal places.
Work out the lower bound of $\frac{p + q}{r}$. Give your answer correct to 3 significant figures.
(Calculator)

10 The price of a tablet is increased by 40%.
Later the new price is reduced by 15% in a sale.
The sale price is £130.90.
Work out the price before the increase.
(Calculator)