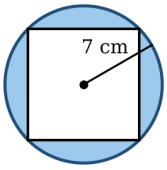
Day 195	IGCSE 10-a-day
1 $y = 2x^3 + 3x^2 - 6$ (a) Show that there is a stationary point at $x = -1$. (b) By finding the gradient when $x = -\frac{3}{2}$ and when $x = -\frac{1}{2}$, decide whether it is a maximum or a minimum.	
2 Solve $\frac{x-3}{3} + \frac{x-5}{2} = -1$	
3 A cylinder has radius r cm and fixed height 6 cm. Its volume is $V = 6\pi r^2$ cm^3. (a) Find $\frac{dV}{dr}$ when $r = 9$. (b) Find the value of r when $\frac{dV}{dr} = 108\pi$.	
4 y is directly proportional to x. When $x = 2$, $y = 12$. When $x = 3$, $y = a$. When $x = b$, $y = 36$. Work out the values of a and b.	
5 $y = -3x - \frac{12}{x}$ Find the coordinates of the stationary points and determine whether each is a maximum or a minimum.	

Day 195 **IGCSE 10-a-day**

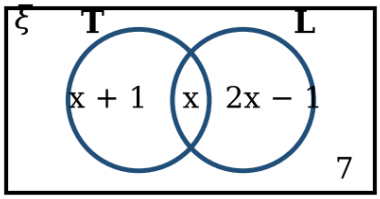
6 The value of a house is decreased by 5% in one year.
The next year its value is increased by 30%.
The next year its value is increased by 40%.
It is now worth £466,830.
Work out the value of the house before the first change.

7 The diagram shows a square inside a circle of radius 7 cm.
The four vertices of the square lie on the circle.
Work out the area of the shaded region. Give your answer in terms of π.



8 Here are the first five terms of a sequence.
4, 13, 46, 115, 232
The nth term is of the form $an^3 + bn + c$.
Find the values of a, b and c.

9 The Venn diagram shows how many of 35 students have a tablet (T) or a laptop (L).
(a) Work out the value of x.
(b) A student is chosen at random from those who have a laptop. Work out the probability that this student also has a tablet.



10 OA = $\mathbf{a}$ and OB = $\mathbf{b}$.
OP = $2\mathbf{a} - 2\mathbf{b}$, OQ = $-4\mathbf{a} + \mathbf{b}$ and OR = $-6\mathbf{a} + 2\mathbf{b}$.
(a) Show that P, Q and R lie on a straight line.
(b) Work out the ratio PQ : QR in its simplest form.