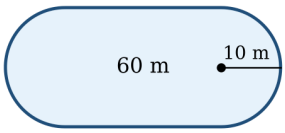
Day 360	IGCSE 10-a-day
1 $y = x(x - 4)(2x - 1)$ Find $\frac{dy}{dx}$.	
2 $\mathbf{v} = \begin{pmatrix} -2 \\ -5 \end{pmatrix}$. Find $\lvert\mathbf{v}\rvert$. Give your answer as a surd in its simplest form.	
3 9 machines can make a batch of bolts in 12 hours. After 5 hours, 2 of the machines leave. The rest carry on working at the same rate. How many more hours does it take to finish?	
4 A rectangle has length $(x + 6)$ cm and width $(x + 4)$ cm. The area of the rectangle is 99 cm^2. (a) Show that $x^2 + 10x - 75 = 0$ (b) Work out the perimeter of the rectangle.	
5 The diagram shows a running track made from a rectangle and two semicircles. (a) Work out the total length of the boundary of the track. (b) Work out the area enclosed by the track. Give your answers in terms of π. The diagram is not drawn accurately. 	

Day 360	IGCSE 10-a-day
6 A shop mixes two types of mixed nuts. Type A costs £6.00 per kg and type B costs £4.00 per kg. They are mixed in the ratio A : B = 1 : 4. The mixture is sold for £5.72 per kg. Work out the percentage profit.	
7 The curve $y = -2x^2 - 4x + 6$ and the line $y = -2x + 2$ 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.	
8 The number of members of a club is increased by 10% in one year. The next year the number of members is decreased by 10%. There are now 891 members. How many members were there to begin with?	
9 Machine A makes 70% of the items and machine B makes the rest. 7% of items from A are faulty and 1% of items from B are faulty. An item is chosen at random. (a) Work out the probability that the item is faulty. (b) The item is faulty. Work out the probability that it came from machine A.	
10 The diagram shows the curve $y = 108 - x^2$. Rectangle ABCD has A, B on the x-axis and C, D on the curve. B is (x, 0). (a) Show that the area of ABCD is $-2x^3 + 216x$. (b) Find the maximum area of ABCD, showing that it is a maximum. 