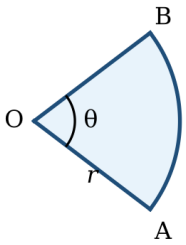
Day 191 **A Level Maths: B Tier 10-a-day**

1 The diagram shows a sector OAB of a circle with centre O, radius 8 cm and angle 1.5 radians.
Find (a) the arc length AB, (b) the area of the sector.



2 A charity raises £250 in week 1. In each following week it raises
£15 more than in the previous week.
(a) Find the amount raised in week 10.
(b) Find the total for the first 24 weeks.

3 For 11 pairs of data, $S_{xx} = 80$, $S_{yy} = 125$ and $S_{xy} = -47$.
Find the PMCC (3 s.f.) and describe the correlation.

4 An arithmetic sequence has 4th term 38 and 11th term 80.
(a) Find the first term and the common difference.
(b) Find the sum of the first 25 terms.

5 Find the exact value, in radians, of
(a) $\arccos(-\frac{1}{2})$ (b) $\arctan(\sqrt{3})$

Day 191	A Level Maths: B Tier 10-a-day
6 A factory says a proportion 0.3 of its parts are defective. In a sample of 20 parts, 11 are defective. Test, at the 5% significance level, whether the proportion is different from 0.3.	
7 A ball is thrown vertically upwards at 9.8 m s^{-1} from a point 14.7 m above horizontal ground. Take g = 9.8 m s^{-2}. Find the time before it hits the ground.	
8 Points A, B and C have position vectors $\begin{pmatrix}-2\\-3\\1\end{pmatrix}$, $\begin{pmatrix}-2\\-6\\-2\end{pmatrix}$ and $\begin{pmatrix}-2\\-12\\r\end{pmatrix}$ respectively. Given that A, B, C are collinear, find r.	
9 Prove by contradiction that there are no integers m and n such that 8m + 6n = 105.	
10 A drone moves with constant velocity $(-\mathbf{i} - \mathbf{j})$ m s^{-1}. At time t = 0 its position vector relative to a fixed origin O is $(\mathbf{i} + 7\mathbf{j})$ m. Find (a) its position vector when t = 4, (b) the value of t when it crosses the line through O in the direction of $\mathbf{i}$.	