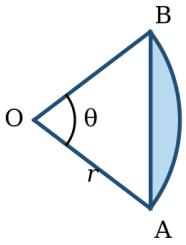
Day 200 **A Level Maths: B Tier 10-a-day**

1 A particle has velocity $(3\mathbf{i} - \mathbf{j})$ m s^{-1} at time t = 0 and moves with constant acceleration $(-3\mathbf{i} - 3\mathbf{j})$ m s^{-2}.
Find its velocity and speed when t = 5.

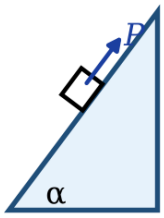
2 The shaded region is the segment cut off by the chord AB of a circle with centre O and radius 11 cm. Angle AOB = 1.1 radians.
Find the area of the segment, to 3 s.f.



3 $f(x) = \sqrt{x - 1} + 3$.
(a) Find the largest possible domain of f.
(b) Find the range of f.

4 A bag has 6 white and 5 black sweets; two are taken without replacement.
(a) Find P(same colour).
(b) Given they are the same colour, find P(both white).

5 Given that $\cos\theta = -\frac{5}{13}$ and $90° < \theta < 180°$, find the exact value of $\tan 2\theta$.

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6 Prove that $-x^2 + 8x - 23 < 0$ for all real values of x.	
7 The variables x and y satisfy $y = Ae^{kx}$. A graph of ln y against x is a straight line through (0, 1) and (4, 2.6). Find A to 3 s.f. and k.	
8 A factory says a proportion 0.3 of its parts are defective. In a sample of 25 parts, 3 are defective. Test, at the 5% significance level, whether the proportion is different from 0.3.	
9 A block of mass 5 kg is held on a rough plane ($\tan\alpha = \frac{4}{3}$, $\mu = 0.2$) by a force P N up the plane, as shown. Take g = 9.8 m s^{-2}. The block is about to move up the plane. Find P. 	
10 A curve has parametric equations $x = 2t$, $y = t^2 - t$. The line y = x meets the curve at two points. Find the coordinates of these points.	