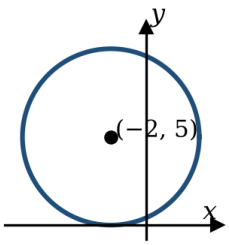
Day 143 **A Level Maths: C Tier 10-a-day**

1 The diagram shows a circle with the centre marked.
The circle touches the x-axis. Find the equation of the circle.



2 Solve (a) $e^x = 7$ (b) $\ln x = 2.5$
Give answers to 3 significant figures.

3 A fair die is rolled until a six appears. X is the number of rolls.
Find E(X).

4 Use $\sin\theta \approx \theta$ and $\cos\theta \approx 1 - \frac{\theta^2}{2}$ to estimate $\frac{\sin 0.05}{\cos 0.05}$.

5 Car A passes a point O at constant speed 3.5 m s^{-1}.
At that instant car B starts from rest at O with constant acceleration 1 m s^{-2} in the same direction. Find the time when B catches up A.

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6 Find the equation of the normal to the curve $y = 3x^3 + x^2 + 4$ at the point where $x = 2$.	
7 X ~ B(n, p) has mean 32 and variance 6.4. Find n and p.	
8 Find the set of values of x satisfying both $2x + 5 < 11$ and $x^2 - 7x + 6 < 0$.	
9 A block of mass 10 kg is pulled along rough horizontal ground by a horizontal force of 54.4 N. The coefficient of friction is 0.3. Take g = 9.8 m s^{-2}. Find the acceleration.	
10 $f(x) = x^3 - 5x^2 - 16x + 80$ (a) Show that $(x - 4)$ is a factor of f(x). (b) Factorise f(x) completely.	