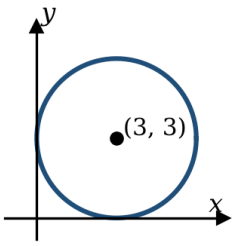
Day 155 **A Level Maths: C Tier 10-a-day**

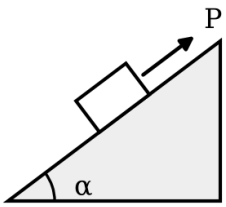
1 Find $\int (2x + 1)^4 \, dx$.

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



3 Solve $\sin x = \frac{\sqrt{3}}{2}$ for $0° \leq x \leq 360°$.

4 A particle of mass 15 kg rests on a smooth plane inclined at α to the horizontal, where $\tan \alpha = \frac{3}{4}$.
It is held by a force P N up the slope. Take $g = 9.8$ m s^{-2}. Find P and the normal reaction.

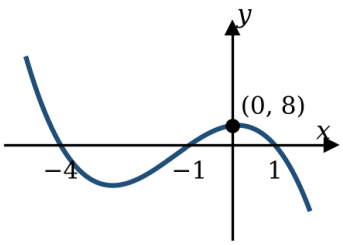


5 In a histogram, the class 30 to 35 has frequency 50 and is drawn with a bar of height 4 cm.
The class 35 to 55 has frequency 35. Find the height of its bar.

Day 155 **A Level Maths: C Tier 10-a-day**

6 A line has equation $\mathbf{r} = \begin{pmatrix} 2 \\ 0 \\ -3 \end{pmatrix} + t\begin{pmatrix} -2 \\ 1 \\ 3 \end{pmatrix}$.
Write down a vector equation of the line through the origin, parallel to this line.

7 The diagram shows the curve $y = f(x)$, where $f(x)$ is a cubic. Find $f(x)$ in the form $k(x - a)(x - b)(x - c)$.



8 A rock is thrown vertically upwards with speed 49 m s^{-1}. Take g = 9.8 m s^{-2}.
(a) Find the time taken to reach its greatest height.
(b) Find the greatest height reached.

9 The probability that it rains is 0.3. If so, the probability that Sam is late is 0.6; otherwise it is 0.3.
Given that Sam is late, find the probability that it rains.

10 Find the range of values of k for which $kx^2 + 8x + 5 = 0$ has real roots.