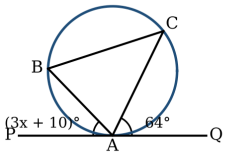
Day 255 **IGCSE 10-a-day**

1 PAQ is a tangent to the circle at A. B and C are points on the circle. Angle PAB = (3x + 10)°, angle ACB = (x + 34)° and angle CAQ = 64°.
(a) Work out the value of x.
(b) Work out the size of angle BAC.
The diagram is not drawn accurately.



2 Solve $x^2 - 8x - 3 = 0$
Give your answers in the form $a \pm \sqrt{b}$

3 $f(x) = x^2 - 5x - 3$ and $g(x) = -3x + 5$.
Solve $f(x) = g(x)$.

4 A concrete slab in the shape of a cuboid weighs 1140 N.
Its smallest face has area 300 cm^2. Its largest face has area 3,000 cm^2.
Pressure = force ÷ area
Work out (a) the greatest pressure and (b) the least pressure the concrete slab can exert on the ground, in N/m^2.

5 Ivan invests £6,000 in an account paying compound interest.
The interest rate is the same percentage each year.
After 3 years the account holds £7,986.
Work out the annual percentage interest rate.

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6 The curve $y = x^3 - 3x^2 - 9x + k$, where k is a constant, has the x-axis as a tangent. Find the two possible values of k.	
7 In a club, the ratio of the number of boys to the number of girls is 5 : 2. Then 15 boys are removed and 5 girls are removed. The ratio is now 2 : 1. How many girls were there at the start?	
8 A particle moves in a straight line. After t seconds, its displacement from a fixed point O is s metres, where $s = -t^3 + 12t^2 + 3t$ for $t \geq 0$ Find the greatest speed of the particle, and the value of t at which it occurs.	
9 p = 8.6 and r = 4, each correct to 1 decimal place. q = 2.06, correct to 2 decimal places. Work out the upper bound of $\frac{p - q}{r}$. Give your answer correct to 3 significant figures. (Calculator)	
10 A curve has equation $y = x + \frac{54}{\sqrt{x}}$ for $x > 0$. Find the coordinates of the stationary point and determine its nature.	