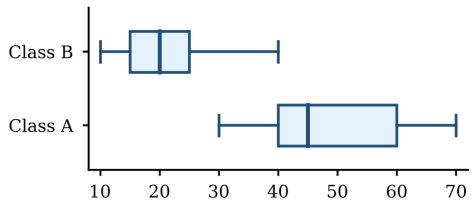
Day 27 **A Level Maths: B Tier 10-a-day**

1 A circle has centre $(-5, 1)$ and passes through the point $(4, -6)$.
Find an equation of the circle.

2 The box plots show the marks in a mock exam for two groups.
(a) Find the interquartile range of each group.
(b) Compare the two distributions.



3 Express $4\sin\theta - 3\cos\theta$ in the form $R\sin(\theta - \alpha)$, with $R > 0$ and $0 < \alpha < 90°$.
Hence state the minimum value of the expression. Give α to 1 d.p.

4 Simplify $\dfrac{(3x^2)^2 \times 2x^2}{9x^7}$.

5 Solve $2\sin^2 x + \sin x - 1 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p. where necessary.

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6 A particle moves so that at time t s its velocity is $\mathbf{v} = (3t^2 + 5)\mathbf{i} + (5t - 15)\mathbf{j}$ m s^{-1}. Find the time when the particle is moving in the direction of $\mathbf{i}$, and its speed then.	
7 Express $\frac{-2x^2 - 29x - 59}{(x - 2)(x + 3)^2}$ in partial fractions.	
8 A block of mass 3 kg is released from rest on a rough plane inclined at angle α to the horizontal, where $\tan\alpha = \frac{5}{12}$. The coefficient of friction is 0.2. Take g = 9.8 m s^{-2}. Find the acceleration down the plane, and the distance moved in 2 s.	
9 The random variable X is normally distributed. P(X < 20) = 0.1587 and P(X > 45) = 0.0668. Find the mean and standard deviation (3 s.f.).	
10 Given that $\tan\theta = -\frac{5}{12}$ and $90° < \theta < 180°$, find the exact value of $\sin 2\theta$.	