Day 192 **A Level Maths: B Tier 10-a-day**

1 Solve $6x - 9 < -4x$.

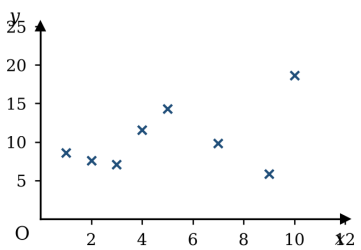
2 A sector of a circle has area 135.2 cm^2 and angle 1.6 radians.
Find (a) the radius, (b) the perimeter of the sector.

3 A block slides from rest down a line of greatest slope of a smooth plane inclined at α, where $\sin\alpha = \frac{3}{5}$ to the horizontal.

Take $g = 9.8$ m s^{-2}.
Find its acceleration, and the distance it travels in 3 s.

4 The points A, B and C are $(-4, -5)$, $(-3, -2)$ and $(0, -3)$.
(a) Show that angle ABC = 90°.
(b) Find the area of triangle ABC.

5 The scatter diagram shows eight pairs of values of x and y.
(a) Describe the correlation.
(b) Why should $y = 5 + x$ not be used for $x = 14$?



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6 A is the point (8, 2) and B is the point (7, −4). Find the perpendicular bisector of AB as ax + by + c = 0, with integer a, b, c.	
7 For small θ (in radians), use $\sin\theta \approx \theta$ and $\cos\theta \approx 1 - \frac{\theta^2}{2}$ to find the value of $\lim_{\theta \to 0} \frac{1 - \cos 4\theta}{\theta \sin 3\theta}$.	
8 A particle moves in a straight line. At time t s its velocity is $v = 48t - 6t^2$ m s^{-1}, for $t \geq 0$. Find the maximum speed of the particle and the time at which it occurs.	
9 X ~ B(60, 0.5). Use a normal approximation to find P(29 ≤ X ≤ 35), to 3 significant figures.	
10 $f(x) = \ln x + x - 3$. Use the Newton-Raphson method with $x_0 = 2$ to find x_1 and x_2, to 4 d.p.	