Day 330 **A Level Maths: C Tier 10-a-day**

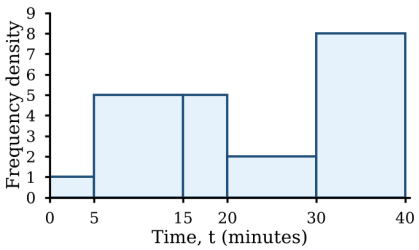
1 A curve has parametric equations
$x = t + 2$, $y = 2t^2 - 1$.
Find the coordinates of the point where $t = -2$.

2 A has coordinates $(-1, 4, -3)$ and B has coordinates $(2, -2, -5)$.
Find (a) the vector AB, (b) the distance AB, (c) the midpoint of AB.

3 A particle moves in a straight line. Its acceleration at time t seconds is $(t - 5)$ m s^{-2}.
When $t = 0$ its velocity is 6 m s^{-1}.
Find its velocity when $t = 4$.

4 A sector has radius 5 cm and area 22.5 cm^2.
Find the angle of the sector in radians and the arc length.

5 The histogram shows the times, t minutes, taken by some people to complete a puzzle.
Find the number of people who took between 20 and 40 minutes.



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6 Prove by contradiction that there are no integers x and y such that 10x + 20y = 47.	
7 15 pairs of data on height and arm span have r = −0.36. Test, at the 5% significance level, for evidence of negative correlation. The critical value is −0.4409.	
8 Car A passes a point O at constant speed 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.	
9 $\mathbf{a} = 4\mathbf{i} + \mathbf{j} - \mathbf{k}$ and $\mathbf{b} = 2\mathbf{i} + 2\mathbf{j} - 3\mathbf{k}$. Find the angle between a and b, to 1 decimal place.	
10 A is (−1, 1) and B is (7, 1). AB is a diameter of a circle. Find the equation of the circle.	