Day 36	A Level Maths: C Tier 10-a-day
1 A(−1, 0), B(7, −4) and C(13, k). Given that A, B and C are collinear, find k.	
2 A particle moves in a straight line. Its velocity at time t seconds is $v = (t^2 - 7t + 12)$ m s^{-1}. (a) Find the times when the particle is at rest. (b) Find its acceleration at the first of these times.	
3 A geometric sequence begins 4, −8, 16, ... Find the common ratio and the 7th term.	
4 The curve $y = ab^x$ passes through (0, 3) and $(3, \frac{3}{8})$. Find the values of a and b.	
5 X ~ B(12, 0.5). Find P(X = 6), giving your answer to 3 s.f.	

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6 A rope pulls a box with a force of 10 N at an angle of 60° above the horizontal. Find the horizontal and vertical components of the force, to 3 s.f.	
7 The circle $(x + 1)^2 + (y + 1)^2 = 29$ passes through P(−3, −6). Find the gradient of the tangent to the circle at P.	
8 The probability that it rains is 0.3. If so, the probability that Sam is late is 0.7; otherwise it is 0.4. Given that Sam is late, find the probability that it rains.	
9 The line $y = 3x + k$ is a tangent to the curve $y = x^2 + x - 2$. Find the value of k.	
10 The diagram shows the curve $y = 2x(8 - x)$. Find the area of the shaded region, between the curve and the x-axis. 	