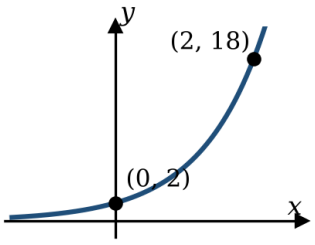
Day 294	A Level Maths: C Tier 10-a-day
1 A particle moves with constant velocity $(-2\mathbf{i} + 3\mathbf{j})$ m s^{-1}. It is at the point with position vector $(-\mathbf{i} + \mathbf{j})$ m at t = 0. Find the time when its position vector is $(-13\mathbf{i} + 19\mathbf{j})$ m.	
2 A circle has equation $(x - 2)^2 + (y + 2)^2 = 16$. Determine whether the point P(4, −7) is inside, outside or on the circle.	
3 A horizontal force of 14 N acts on a box of mass 50 kg on a smooth horizontal surface. Find the acceleration.	
4 The diagram shows the curve $y = ab^x$, where $b > 0$. Find the values of a and b. 	
5 A sector has radius 4 cm and arc length 7.00 cm. Find the angle of the sector in radians and the area of the sector.	

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6 $f(x) = (x + 2)^2 - 4$, $x \geq 0$. Find the range of f.	
7 $\frac{-x + 1}{(x + 1)(x + 3)} \equiv \frac{A}{x + 1} + \frac{B}{x + 3}$. Find A and B, and hence find $\int \frac{-x + 1}{(x + 1)(x + 3)}\, dx$.	
8 A population is $N(\mu, 2^2)$. H_0: $\mu = 165$, H_1: $\mu \neq 165$. A sample of 36 has mean $\bar{x} = 165.4$. Test at the 5% level. Critical value: $z = \pm 1.96$.	
9 Use the quotient rule to find the derivative of $y = \frac{x}{x + 4}$.	
10 $X \sim B(10, p)$. H_0: $p = 0.4$, H_1: $p \neq 0.4$. In a sample, $x = 6$. Test at the 5% significance level.	