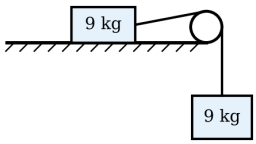
Day 338	A Level Maths: B Tier 10-a-day
1 A sector of a circle has area 157.5 cm^2 and angle 1.4 radians. Find (a) the radius, (b) the perimeter of the sector.	
2 A trolley of mass 10 kg is moving on a smooth horizontal surface at 4 m s^{-1} when a constant horizontal force of 10 N, in the direction of motion, acts for 7 s. Find the speed of the trolley at the end of this time and the distance it moves.	
3 For 10 pairs of values, $\bar{x} = 10$, $\bar{y} = 18$, $S_{xx} = 80$ and $S_{xy} = -160$. (a) Find the regression line of y on x in the form $y = a + bx$. (b) Estimate y when $x = 8$.	
4 Find y in terms of x, given that $\frac{dy}{dx} = \frac{5x}{y}$ and $y = 2$ when $x = 0$.	
5 Prove that $n^3 + 5n + 11$ is odd for all integers n.	

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6 Solve $3\tan^2 x + 7\sec x + 7 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p.	
7 Given that each attempt at a task succeeds independently with probability 0.15, find the least number of attempts needed for the probability of at least one success to exceed 0.99.	
8 Prove, by exhaustion, that a square number cannot be written in the form $3k + 2$, where k is an integer.	
9 A block of mass 9 kg lies on a rough horizontal table (coefficient of friction 0.2). It is joined by a light string over a smooth pulley to a particle of mass 9 kg hanging freely. Take $g = 9.8$ m s^{-2}. The system is released. Find the acceleration and the tension in the string. 	
10 $f(x) = x^3 + px^2 + qx + 8$. When f(x) is divided by $(x + 1)$ the remainder is 12, and when divided by $(x + 3)$ the remainder is 8. Find p and q.	