Day 237	A Level Maths: B Tier 10-a-day
1 A company employs 100 managers, 260 technicians and 160 operators. A stratified sample of size 26 is taken. Find the number selected from each group.	
2 Solve $\ln(5x + 5) = 5$, giving your answer to 3 s.f.	
3 A box of mass 20 kg rests on a rough horizontal floor, with coefficient of friction 0.6. A horizontal force of 94 N is applied to the box. Take $g = 9.8$ m s^{-2}. Determine whether the box moves. Find the friction force, or the acceleration if it moves.	
4 Express $\cos\theta + 3\sin\theta$ in the form $R\cos(\theta - \alpha)$, where $R > 0$ and $0 < \alpha < 90°$. Give α to 1 d.p.	
5 A particle 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 2 s.	

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6 Solve $\tan^2 x + \tan x - 2 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p. where necessary.	
7 Find the coefficient of x^2 in the expansion of $(1 + 4x)(2 + x)^7$.	
8 $X \sim B(60, 0.5)$. Use a normal approximation to find $P(X \geq 25)$, to 3 significant figures.	
9 The line $4x - 3y = k$ is a tangent to the circle $(x + 1)^2 + (y + 2)^2 = 25$. Find the two possible values of k.	
10 A circle has centre (3, 1) and passes through the point (−5, 3). Find an equation of the circle.	