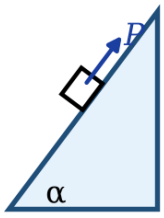
Day 71	A Level Maths: B Tier 10-a-day
1 A company employs 50 managers, 130 technicians and 80 operators. A stratified sample of size 26 is taken. Find the number selected from each group.	
2 Expand and simplify $(-1 + 4\sqrt{3})(1 - \sqrt{3})$, giving your answer in the form $a + b\sqrt{3}$.	
3 A particle of mass 2 kg is acted on by forces $(3\mathbf{i} + 7\mathbf{j})$ N and $\mathbf{P}$ N only. Its acceleration is $(2\mathbf{i})$ m s^{-2}. Find $\mathbf{P}$, and its magnitude to 3 significant figures.	
4 A charity raises £100 in week 1. In each following week it raises £10 more than in the previous week. (a) Find the amount raised in week 11. (b) Find the total for the first 17 weeks.	
5 Use the substitution $u = \cos x$ to find the exact value of $\int_0^{\frac{\pi}{3}} \sin x \cos^2 x \, dx$.	

Day 71 **A Level Maths: B Tier 10-a-day**

6 The circle C has equation $(x - 4)^2 + (y + 1)^2 = 13$.
The point P(6, −4) lies on C.
Find an equation of the tangent to C at P, in the form ax + by + c = 0 with integer a, b, c.

7 A block of mass 2 kg is held on a rough plane ($\tan\alpha = \frac{4}{3}$, $\mu = 0.75$) by a force P N up the plane, as shown.
Take g = 9.8 m s^{-2}. The block is about to move up the plane. Find P.



8 Find the coordinates of the stationary point of the curve $y = xe^{3x}$,
and determine its nature.

9 The scores on a test are normally distributed.
P(X < 64) = 0.0228 and P(X > 88) = 0.1587.
Find the mean and standard deviation (3 s.f.).

10 The region R is bounded by the curve $y = \sqrt{6}\sqrt{x}$, the x-axis
and the lines x = 0 and x = 4.
R is rotated through 360° about the x-axis. Find the exact volume generated.

