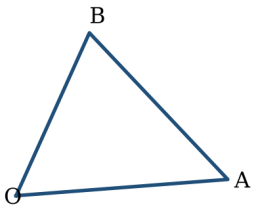
Day 153	A Level Maths: B Tier 10-a-day
1 A sports club has 64 junior members, 120 senior members and 40 veteran members. A stratified sample of size 28 is taken. Find the number selected from each group.	
2 A sector of a circle has radius 10 cm and arc length 16 cm. Find (a) the angle of the sector in radians, (b) the area of the sector.	
3 A particle has velocity $(-5\mathbf{i} - 4\mathbf{j})$ m s^{-1} at time t = 0 and moves with constant acceleration $(2\mathbf{i} + 2\mathbf{j})$ m s^{-2}. Find its velocity and speed when t = 4.	
4 Simplify $\frac{1 + \cos 6x}{2 \cos 3x}$, giving your answer as a single trigonometric term.	
5 In the binomial expansion of $(1 + kx)^n$, where n is a positive integer, the coefficient of x is -12 and the coefficient of x^2 is 60. Find the values of n and k.	

Day 153 **A Level Maths: B Tier 10-a-day**

6 In triangle OAB, OA = a and OB = b. M lies on AB with AM : MB = 1 : 2, and N lies on OB with ON : NB = 2 : 1.
Find OM and NM in terms of a and b.



7 A player says she scores with probability 0.5. In 25 shots she scores 10 times.
Test, at the 1% level, whether the true proportion is lower than claimed.

8 A uniform rod AB of length 6 m and mass 18 kg is hinged at A and held horizontal by a light string attached at B.
The string makes an angle θ with the rod, where $\sin\theta = \frac{4}{5}$. Take g = 9.8 m s^{-2}. Find the tension in the string.

9 Prove by contradiction that $\sqrt{3}$ is irrational.

10 The line l has equation $y = 2x - 2$. The point P is $(-7, -1)$.
(a) Find the line through P perpendicular to l, as $ax + by + c = 0$ with integer a, b, c.
(b) Find the foot F and the exact distance PF.