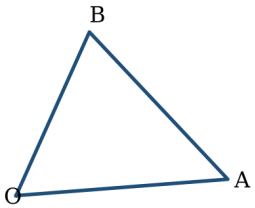
Day 248	A Level Maths: B Tier 10-a-day
1 Two forces of magnitude 10 N and 24 N act at right angles on a particle. Find the magnitude of the resultant, and the angle it makes with the 10 N force, to 1 d.p.	
2 Line l_1 has equation $7x - 4y = -21$ and line l_2 has equation $7x + 5y = 42$. The lines meet at P. Find the area of the triangle formed by l_1, l_2 and the x-axis.	
3 Given that $y = (x + 2)e^x$, find $\frac{dy}{dx}$, and its value when $x = 0$.	
4 A woman of mass 90 kg stands on weighing scales in a lift. The lift decelerates at 0.25 m s^{-2} while moving downwards. Take $g = 9.8$ m s^{-2}. Find the force exerted on the woman by the scales.	
5 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 = 1 : 1. Find OM and NM in terms of a and b. 	

Day 248 **A Level Maths: B Tier 10-a-day**

6 Prove that $n^3 + 7n + 2$ is even for all integers n.

7 Each of 5 people independently supports a team with probability 0.4; X is the number of supporters.
This is done 100 times. Estimate the number of times that X = 3.

8 (a) Expand $(1 + 2x)^{-2}$ up to the x^2 term.

(b) Use x = 0.01 to estimate $\frac{1}{1.02^2}$ to 5 decimal places.

9 Given that $15\cos\theta + 8\sin\theta \equiv 17\cos(\theta - 28.1°)$,
solve $15\cos\theta + 8\sin\theta = -0.5$ for $0 \leq \theta \leq 360°$. (1 d.p.)

10 $X \sim N(50, 10^2)$. The shaded area on the diagram represents the probability that X lies between two values.
Find this probability to 3 significant figures.

