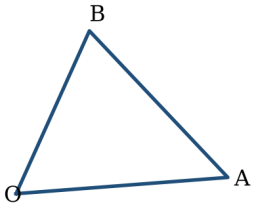
Day 263	A Level Maths: B Tier 10-a-day
1 Given that $y = \frac{e^{2x}}{x+3}$, find $\frac{dy}{dx}$, and its value when $x = 0$.	
2 Two forces of magnitude 9 N and 12 N act at right angles on a particle. Find the magnitude of the resultant, and the angle it makes with the 9 N force, to 1 d.p.	
3 Given that $\tan\theta = \frac{1}{2}$ and θ is acute, find the exact value of $\sec\theta$.	
4 $f(x) = 2x^3 + kx^2 + 8x$. Given that $(x + 4)$ is a factor of $f(x)$, (a) find the value of k, (b) factorise $f(x)$ completely.	
5 A particle of mass 8 kg is moving on a smooth horizontal surface at 1 m s^{-1} when a constant horizontal force of 12 N, in the direction of motion, acts for 3 s. Find the speed of the particle at the end of this time and the distance it moves.	

Day 263 **A Level Maths: B Tier 10-a-day**

6 The masses (kg) of parcels are normally distributed.
$P(X < 90) = 0.1587$ and $P(X > 110) = 0.1587$.
Find the mean and standard deviation (3 s.f.).

7 In triangle OAB, OA = a and OB = b. M lies on AB with AM : MB = 1 : 3, and N lies on OB with ON : NB = 1 : 2.
Find OM and NM in terms of a and b.



8 The table summarises 50 measurements of t.
(a) Estimate the mean.
(b) Estimate the median using linear interpolation.

t (minutes)	Frequency
$40 \le t < 50$	7
$50 \le t < 60$	13
$60 \le t < 70$	7
$70 \le t < 80$	10
$80 \le t < 90$	13

9 Find the coefficient of x^2 in the expansion of $(2 + 4x)(3 + x)^4$.

10 Express $\frac{4}{1 - \sqrt{2}}$ in the form $p + q\sqrt{2}$, where p and q are integers.