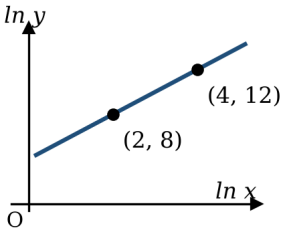
Day 351	A Level Maths: A Tier 10-a-day
1 X is normally distributed with mean μ and standard deviation 8. Given that P(X < 61) = 0.0228, find μ to 3 significant figures.	
2 Find the exact value of $\int_0^3 (4x)^2 \, dx$.	
3 A group of 6 boys and 8 girls. A team of 3 is chosen at random. Find the probability that all the team are of the same sex.	
4 A charity raises £500 in its first year and in each later year raises £50 more than in the previous year. (a) How much does it raise in year 17? (b) In which year does the total raised first exceed £5000?	
5 |a| = 5, |b| = 4 and the angle between a and b is 120°. Find the exact values of a·b and |a + b|.	

Day 351 **A Level Maths: A Tier 10-a-day**

6 At 12:00 ship P has position $(16\mathbf{i} - 20\mathbf{j})$ km and velocity $(-4\mathbf{i} + 5\mathbf{j})$ km h^{-1}; ship Q has position $(16\mathbf{i} + 20\mathbf{j})$ km and velocity $(-4\mathbf{i} - 3\mathbf{j})$ km h^{-1}. Show that the ships collide and find the time and position vector of the collision.

7 The diagram shows the graph of ln y against ln x for $y = A x^n$.
Find the value of n and the exact value of A.



8 The second term of a geometric series is 9 and its sum to infinity is 48.
Find the two possible values of the first term.

9 A sequence is defined by $u_1 = 5$ and $u_{n+1} = \frac{1}{1 - u_n}$.
(a) Find u_2 and u_3.
(b) Find u_{100} and $\sum_{r=1}^{100} u_r$.

10 A particle is projected at 9.8 m s^{-1} up a line of greatest slope of a rough plane inclined at α, where $\tan\alpha = \frac{3}{4}$. The coefficient of friction is 0.5. Find (a) the greatest distance it moves up the plane, (b) its speed on returning to the start. Take g = 9.8. Give answers to 3 s.f. if not exact.