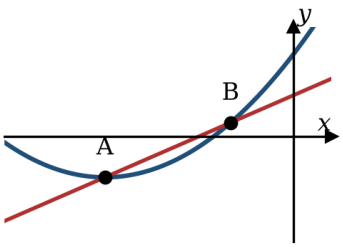
Day 302	A Level Maths: A Tier 10-a-day
1 A ball is thrown vertically upwards at 14.7 m s^{-1} from a point h m above horizontal ground, and hits the ground 5 s later. Find (a) h, (b) the greatest height above the ground. Take g = 9.8.	
2 The 3rd term of a geometric sequence is 24 and the 5th term is 96. Find the common ratio and the first term. Find the sum of the first 8 terms.	
3 Use the trapezium rule with 4 strips to estimate $\int_1^5 \ln x \, dx$, giving your answer to 3 s.f. State, with a reason, whether your estimate is an overestimate or an underestimate.	
4 The diagram shows the curve $y = x^2 + 6x + 6$ and the line $y = 2x + 3$, meeting at A and B. (a) Find the coordinates of A and B. (b) Find the coordinates of the midpoint of AB. 	
5 A bag has 3 green and 5 yellow counters. Two are taken at random without replacement. Given that the second counter is green, find the probability that the first was green.	

Day 302	A Level Maths: A Tier 10-a-day
6 A stone is dropped from rest from the top of a cliff. In the last 2 seconds before it hits the sea it falls 147 m. Find the height of the cliff. Take g = 9.8.	
7 $f(x) = x^3 + 3x - 7$. Use the Newton-Raphson method with $x_0 = 1.5$ to find x_1 and x_2, giving your answers to 4 d.p.	
8 Given that $(x + 4)$ is a factor of $f(x) = x^3 + 2x^2 - 23x - 60$, solve $f(x) > 0$.	
9 25 values have $\Sigma x = 1250$ and $\Sigma x^2 = 62900$. One value was recorded as 58 but should have been 48. Find the correct mean and standard deviation (3 s.f.).	
10 Find the exact value of $\sin(2 \arccos \frac{24}{25})$.	