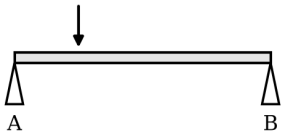
Day 173	A Level Maths: C Tier 10-a-day
1 Differentiate with respect to x: (a) $2e^x + 5 \ln x$ (b) $2 \ln x$	
2 A is (6, 3) and B is (−2, −7). Find (a) the midpoint of AB, (b) the length of AB, as a surd in simplest form.	
3 Find the exact value, in radians, of (a) arccos(−1) (b) arccos(0)	
4 Find an equation of the line through A(−3, −2) and B(−6, −4), in the form ax + by + c = 0, where a, b and c are integers.	
5 A lift of mass 200 kg is raised by a vertical cable with constant acceleration 1 m s^{-2} upwards. Take g = 9.8 m s^{-2}. Find the tension in the cable.	

Day 173	A Level Maths: C Tier 10-a-day
6 $X \sim B(40, p)$. H_0: $p = 0.2$, H_1: $p > 0.2$. Find the critical region for a test at the 5% significance level.	
7 Use $u = x^2 + 3$ to evaluate $\int_0^1 2x(x^2 + 3)^2 \, dx$.	
8 A circle has equation $(x - 4)^2 + y^2 = 25$. Determine whether the point $P(-1, -2)$ is inside, outside or on the circle.	
9 A uniform beam AB of mass 20 kg and length 5 m rests horizontally on supports at A and B. A load of mass 10 kg is placed on the beam 1.25 m from A. Take $g = 9.8$ m s^{-2}. Find the reaction at B. 	
10 $X \sim B(150, 0.5)$. Use a normal approximation to find $P(X \geq 78)$, to 3 s.f.	