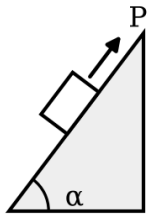
Day 296	A Level Maths: C Tier 10-a-day
1 $f(x) = x^3 - 2x - 6$. Use the Newton-Raphson method with $x_0 = 3$ to find x_1 and x_2, giving your answer to 3 decimal places.	
2 A is $(-4, 4)$ and B is $(-4, -4)$. Find (a) the midpoint of AB, (b) the length of AB, as a surd in simplest form.	
3 Find the exact value, in radians, of (a) $\arccos(-\frac{1}{2})$ (b) $\arccos(1)$	
4 $X \sim B(40, p)$. H_0: $p = 0.6$, H_1: $p < 0.6$. Find the critical region for a test at the 1% significance level.	
5 A block of mass 2 kg is pulled along rough horizontal ground by a horizontal force of 13.8 N. The coefficient of friction is 0.5. Take $g = 9.8$ m s^{-2}. Find the acceleration.	

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6 Solve $2^{4x} = 64$.

7 A particle of mass 5 kg rests on a smooth plane inclined at α to the horizontal, where $\tan \alpha = \frac{4}{3}$. It is held by a force P N up the slope. Take g = 9.8 m s^{-2}. Find P and the normal reaction.



8 Solve $\cos(x + 30°) = \frac{\sqrt{2}}{2}$ for $0° \leq x \leq 360°$.

9 The discrete random variable X has $P(X = x) = k(7 - x)$ for x = 1, 2, 3, 4, 5.
(a) Find the value of k.
(b) Find $P(X \geq 2)$.

10 The line $y = -3x + k$ is a tangent to the curve $y = x^2 + x$.
Find the value of k.