Day 112	A Level Maths: B Tier 10-a-day
1 The line $y = 7x + 46$ meets the circle $(x + 3)^2 + y^2 = 25$ at the points A and B. Find the coordinates of A and B, and the exact length of the chord AB.	
2 A and B are mutually exclusive events with $P(A) = 0.4$ and $P(A \cup B) = 1$. (a) Find P(B). (b) Find $P(A' \cap B')$.	
3 Prove that $(4n + 2)^2 - (4n - 2)^2$ is a multiple of 32 for all integer values of n.	
4 A puck of mass 8 kg is moving on a smooth horizontal surface at 8 m s^{-1} when a constant horizontal force of 4 N, in the direction of motion, acts for 4 s. Find the speed of the puck at the end of this time and the distance it moves.	
5 A player says she scores with probability 0.4. In 15 shots she scores 4 times. Test, at the 5% level, whether the true proportion is lower than claimed.	

Day 112 **A Level Maths: B Tier 10-a-day**

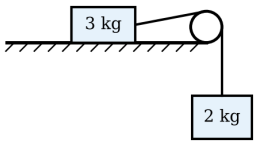
6 (a) Show that $x^3 - 3x - 6 = 0$ can be written as $x = \sqrt[3]{3x + 6}$.

(b) Use $x_{n+1} = \sqrt[3]{3x_n + 6}$ with $x_0 = 2$ to find x_1, x_2, x_3 to 4 d.p.

7 A block of mass 3 kg lies on a rough horizontal table (coefficient of friction 0.25). It is joined by a light string over a smooth pulley to a particle of mass 2 kg hanging freely.

Take $g = 9.8$ m s^{-2}.

The system is released. Find the acceleration and the tension in the string.



8 Solve $e^{2x} - 12e^x + 32 = 0$,
giving your answers as exact values.

9 (a) Expand $(1 - x)^{-\frac{1}{2}}$ up to the x^2 term.

(b) Use $x = 0.01$ to estimate $\frac{1}{\sqrt{0.99}}$ to 5 decimal places.

10 Given that $\sin A = \frac{4}{5}$ and $\sin B = \frac{9}{41}$, where A and B are acute,
find the exact value of $\cos(A + B)$.