Day 119	A Level Maths: B Tier 10-a-day
1 A charity raises £250 in week 1. In each following week it raises £10 more than in the previous week. (a) Find the amount raised in week 12. (b) Find the total for the first 26 weeks.	
2 Solve $4^x = 52$, giving your answer to 3 s.f.	
3 A car of mass 1500 kg moves along a horizontal road. The engine works at a constant rate of 24 kW. The resistance to motion is constant at 600 N. Find the acceleration when the speed is 10 m s^{-1}.	
4 The random variable X has E(X) = 4 and Var(X) = 4. Find (a) E(4X − 4), (b) Var(4X − 4), (c) $E(X^2)$.	
5 A particle is in equilibrium under three forces: P N at angle θ above the positive x-axis, a force of 12 N in the negative x-direction and a force of Q N in the negative y-direction. $\cos\theta = \frac{3}{5}$. Find P and Q.	

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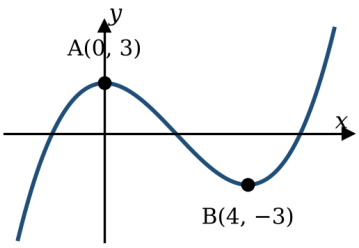
6 Solve $3\cos^2 x + 1 - 4\cos x = 0$ for $0 \leq x \leq 360°$,
giving answers to 1 d.p. where necessary.

7 $f(x) = \sqrt{x + 1} + 4$.
(a) Find the largest possible domain of f.
(b) Find the range of f.

8 The function $f(x) = \ln x + x - 4$.
Show that $f(x) = 0$ has a root between $x = 2.5$ and $x = 3$.

9 The diagram shows the curve $y = f(x)$. A and B are the turning points. Find the turning points of:

(a) $y = 2f(x)$ (b) $y = f(\frac{x}{2})$



10 The table summarises 42 measurements of m.
(a) Estimate the mean.
(b) Estimate the median using linear interpolation.

m (kg)	Frequency
$0 \leq m < 20$	10
$20 \leq m < 40$	10
$40 \leq m < 60$	3
$60 \leq m < 80$	8
$80 \leq m < 100$	11