Day 24	A Level Maths: B Tier 10-a-day
1 Items numbered 1 to 143; systematic sample of size 13. (a) Find the sampling interval. (b) The first item is number 9. Find the 5-th item.	
2 Given that $\sin A = \frac{15}{17}$ and $\cos B = \frac{12}{13}$, where A is obtuse and B is acute, find the exact value of sin(A + B).	
3 X ~ Po(3), modelling the number of emails received per hour. Find, to 3 significant figures, (a) P(X = 3) (b) P(X ≥ 3)	
4 A sector of a circle has radius 5 cm and angle 90°. Find, in terms of π, the arc length and the area of the sector.	
5 Evaluate $\sum_{r=3}^{15}(4r - 4)$.	

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6 A missile is projected horizontally at 137.2 m s^{-1} from a point high above the ground. Take g = 9.8 m s^{-2}. Find the speed and the direction of motion 48 s later, to 1 d.p. below the horizontal.	
7 $\mathbf{a} = \begin{pmatrix} -2 \\ 2 \\ 5 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -2 \\ 1 \\ -4 \end{pmatrix}$. Find the angle between a and b, to 1 d.p.	
8 (a) Expand $(1 + 3x)^{\frac{1}{2}}$ up to the x^2 term. (b) Use x = 0.02 to estimate $\sqrt{1.06}$ to 5 decimal places.	
9 A particle P moves on a straight line from O. At time t s its velocity is $6t^2 - 42t + 60$ m s^{-1}. Find the first time P is at instantaneous rest, and its distance from O then.	
10 Solve $\|4x - 3\| = \|x + 3\|$.	