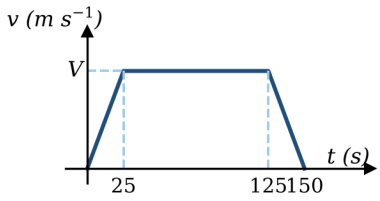
Day 240	A Level Maths: A Tier 10-a-day

1 X ~ B(14, 0.3). Find, to 3 significant figures:
(a) P(X = 3) (b) P(X ≥ 3) (c) P(X ≤ 2)

2 The circle $x^2 + y^2 + 4x + 4y - 17 = 0$ passes through P(−5, −6).
(a) Find the equation of the tangent at P, in the form ax + by = c.
(b) Find the coordinates of the point where this tangent crosses the x-axis.

3 $f(x) = x^3 - 3x - 4$.
Show that the equation f(x) = 0 has a root α in the interval [2, 3].

4 The diagram shows the speed-time graph for a train journey of 3750 m. Find (a) V, (b) the deceleration in the final stage.



5 Solve $2\cos^2 x + \sin x - 2 = 0$
for $0° \leq x \leq 180°$.

Day 240	A Level Maths: A Tier 10-a-day
6 A 15 kg box is pulled from rest along rough horizontal ground by a horizontal force of 66.3 N and moves 25 m in 10 s. Find (a) the coefficient of friction. The force is then removed; (b) find the further distance moved. Take g = 9.8. Give answers to 3 s.f. if not exact.	
7 Solve $\|4x - 5\| > \|2x - 3\|$.	
8 P(B) = 0.35, P(A) = 0.4 and P(A | B) = 0.4. (a) Find $P(A \cap B)$ and $P(A \cup B)$. (b) Find P(B | A). (c) Determine whether A and B are independent.	
9 $f(x) = 2x^2 + 4x - 1$, $x \geq -1$. Find $f^{-1}(x)$ and state its domain.	
10 y = x tan(x). Find the exact gradient at $x = \frac{\pi}{6}$.	