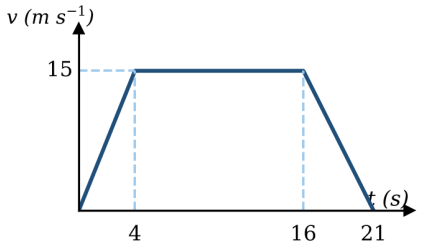
Day 77	A Level Maths: B Tier 10-a-day
1 The points A and B have coordinates $(-4, -5)$ and $(-5, 2)$. (a) Find the midpoint of AB. (b) Find the line AB as $ax + by + c = 0$, with integer a, b, c.	
2 The length X cm of a metal rod is normal with mean 170, s.d. 4. Find k (3 s.f.): (a) $P(X < k) = 0.05$, (b) $P(X > k) = 0.2$.	
3 Given that $y = e^{-2x} \cos x$, find $\frac{dy}{dx}$, and its value when $x = \frac{\pi}{2}$.	
4 The points A, B and C are (3, 5), (4, 4) and (6, 6). (a) Show that angle ABC = 90°. (b) Find the area of triangle ABC.	
5 The diagram shows the speed-time graph of a train between two stations. Find (a) the acceleration in the first 4 s, (b) the distance between the stations. 	

Day 77	A Level Maths: B Tier 10-a-day
6 A curve has parametric equations $x = t^3$, $y = t^2 + 2t$. Find $\frac{dy}{dx}$ in terms of t, and the equation of the tangent at t = 3.	
7 A suitcase of mass 3 kg is dragged at constant speed along rough horizontal ground by a rope inclined at angle α above the horizontal, where $\cos \alpha = \frac{3}{5}$. The coefficient of friction is 0.5. Take g = 9.8 m s^{-2}. Find the tension in the rope.	
8 The continuous random variable X has pdf $f(x) = kx^4$ for $0 \leq x \leq 6$, and 0 otherwise. (a) Find the value of k. (b) Find P(X > 4). (c) Find E(X).	
9 Evaluate $\sum_{r=8}^{20}(2r + 2)$.	
10 Solve $\cos 2x + 3 \sin x = 2$ for $0 \leq x \leq 360°$, giving answers to 1 d.p. where necessary.	