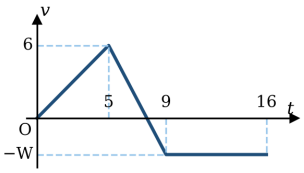
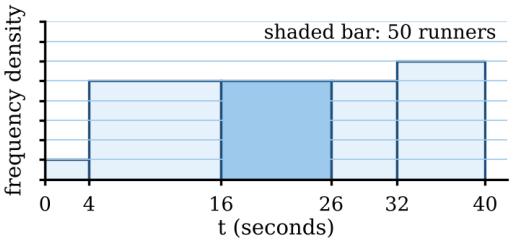
Day 304 **A Level Maths: S Tier 10-a-day**

1 Solve $\cot(2\theta + 40°) = -\sqrt{3}$
for $0° \leq \theta \leq 360°$.

2 The diagram shows the velocity-time graph of a particle P moving on a straight line (velocity in m s^{-1}, time in s). At time 16 s, P is back at its starting point.
Find (a) the value of W, (b) the greatest distance of P from its starting point.



3 The histogram shows the times, t seconds, of some runners.
Find (a) the total number of runners, (b) an estimate of the number with $14 \leq t < 34$.



4 Find the binomial expansion of $(27 - 5x)^{\frac{1}{3}}$ in ascending powers of x up to and including the term in x^3.
State the values of x for which it is valid.

5 A curve has parametric equations $x = 3t^2 + t$, $y = 3t^3 + 4t$.
Find the equation of the tangent at the point where t = 2,
in the form $y = mx + c$.

Day 304	A Level Maths: S Tier 10-a-day
6 Find the sum of all the integers from 1 to 665 inclusive that are divisible by 3 or by 5, but not by both.	
7 A river is 60 m wide and flows at 4 m s^{-1}. A boatman can row at 5 m s^{-1} in still water and wants to reach the point directly opposite his starting point. Find (a) the angle to the bank at which he should head, to 1 d.p., (b) the time taken, to 3 s.f.	
8 Solve $\sqrt{2x + 5} = 2x - 7$.	
9 A closed cylinder has volume 54π cm^3. Find, in terms of π, the minimum possible total surface area, proving that it is a minimum.	
10 Two fair 10-sided dice, numbered 1 to 10, are rolled. M is the smaller of the two scores. (a) Show that $P(M = m) = \frac{(21 - 2m)}{100}$ for m = 1, 2, ..., 10. (b) Find P(M = 6) and E(M).	