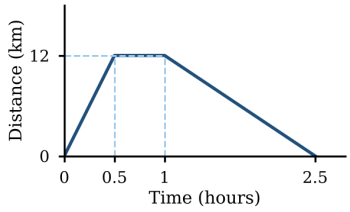
Day 254 **S Tier 10-a-day**

1 The graph shows Hassan's cycle ride to a café and back.
(a) Work out Hassan's speed on the way back.
(b) Work out Hassan's average speed for the whole ride, including the stop.

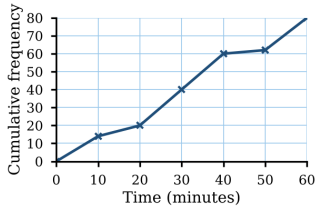


2 Solve $\frac{x+7}{2} + \frac{x-6}{4} = 8$

3 A metal pipe is a hollow cylinder of length 40 cm. (Calculator)
The outer radius is 3 cm and the inner radius is 2.5 cm.
The density of the metal is 2.7 g/cm^3.
Work out the mass of the pipe. Give your answer in kilograms correct to 3 significant figures.

4 A retailer buys a bike and adds a 50% mark-up to get the selling price.
In a sale the selling price is reduced by 30% to £262.50.
Work out how much the shop paid for a bike.

5 The cumulative frequency graph gives information about the times of 80 students to complete a puzzle.
(a) Find an estimate for the median and the interquartile range.
(b) Estimate how many of the 80 had a time greater than 5.



Day 254	S Tier 10-a-day
6 $f(x) = \frac{4x + 6}{x - 3}$ (a) Find $f^{-1}(x)$. (b) Find the value of $f^{-1}(2)$.	
7 Tap A can fill an empty tank in 20 minutes. Tap B can fill an empty tank in 60 minutes. Both are turned on at the same time. How long do they take to fill an empty tank?	
8 A circle has equation $x^2 + y^2 = 25$. The point $P(-4, -3)$ lies on the circle. (a) Find the equation of the tangent to the circle at P. Give your answer in the form $ax + by = c$, where a, b and c are integers. (b) The tangent meets the x-axis at the point T. Write down the coordinates of T.	
9 Given that $(a + \sqrt{5})^2 = 14 + 6\sqrt{5}$, where a is a positive integer, find the value of a.	
10 The equation $2x^2 + 4x + k = 0$ has two different real solutions. Find the range of possible values of k.	