Day 46 **IGCSE 10-a-day**

1 The table gives information about 98 times.
Work out an estimate for the median.
Assume the values in each class are evenly spread.

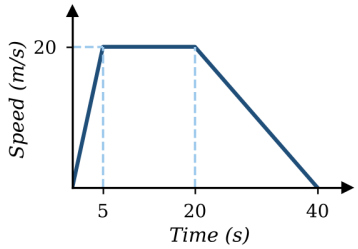
Time, t (minutes)	Frequency
$0 < t \leq 20$	9
$20 < t \leq 40$	26
$40 < t \leq 60$	20
$60 < t \leq 80$	5
$80 < t \leq 100$	28
$100 < t \leq 120$	10

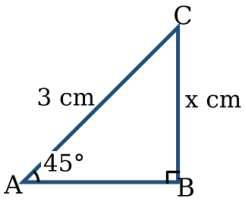
2 Two numbers x and y have a sum of 10.
Find the least possible value of $x^2 + y^2$, showing that it is the least.

3 The ratio of men to women in a school is 2 : 4.
85% of the men and 55% of the women own a car.
What percentage of all of these students own a car?

4 Expand and simplify $(2 + 3\sqrt{3})(3 + \sqrt{3})$
Give your answer in the form $p + q\sqrt{3}$

5 The graph shows the speed of a train between two stations.
(a) Work out the acceleration in the first 5 seconds.
(b) Work out the total distance.



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6 ABC is a right-angled triangle. Work out the exact value of x. Give your answer in its simplest form. The diagram is not drawn accurately.  	
7 The number of visitors to a website, N, after t days is modelled by $N = -2t^3 + 24t^2 + 12t + 200$ for $0 \leq t \leq 16$ Find the time at which N is increasing most rapidly, and the rate of increase at this time.	
8 $n(\xi) = 80$, $n(A) = 20$, $n(B) = 23$ and $n(A \cap B) = 18$. Find $P(A \mid B)$ and $P(B \mid A')$.	
9 A piece of wire 170 cm long is cut into two pieces. One piece is bent to form a square of side x cm. The other piece is bent to form a rectangle whose length is twice its width. (a) Show that the total area, A cm^2, enclosed by the two shapes is $A = x^2 + \frac{(170 - 4x)^2}{18}$. (b) Find the value of x for which A is least, and work out this least area.	
10 V is directly proportional to the square of r. r is increased by 20%. Work out the percentage change in V.	