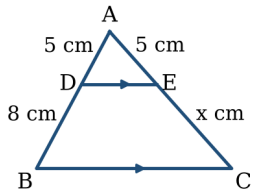
Day 291	A Tier 10-a-day
1 Show that $\frac{\sqrt{180}-\sqrt{125}}{\sqrt{5}}$ is an integer, and find its value.	
2 Two similar model boats have heights 6 cm and 15 cm. The smaller one has a volume of 72 cm^3. Work out the volume of the larger one.	
3 A train travels at 60 km/h for 2 hours 45 minutes. Work out the distance travelled.	
4 Expand and simplify $(x + 1)^2 - (x - 6)(x + 3)$	
5 The ratio of fiction books to non-fiction books in a library shelf is 9 : 11. There are 28 more non-fiction books than fiction books. Work out the number of fiction books.	

Day 291 **A Tier 10-a-day**

6 In triangle ABC, DE is parallel to BC.
D is on AB and E is on AC.
Work out the value of x.
The diagram is not drawn accurately.



7 The graph of y = f(x) has a maximum point at (1, −5).
Write down the coordinates of the turning point of the graph of
(a) y = f(−x)
(b) y = f(x − 1)

8 A ship leaves a port and travels 10 km on a bearing of 100°. (Calculator)
It then travels 24 km on a bearing of 010°.
(a) Work out how far it is now from the port.
(b) Work out the bearing of its final position from the port. Give your answer to the nearest degree.

9 Nadia invests £12,000 in a savings account. (Calculator)
Compound interest is paid at a fixed rate each year.
After 2 years the investment is worth £17,280.
Work out the annual rate of interest.

10 The table gives information about 55 measurements.
A histogram is drawn using this information.
(a) Work out the missing frequency.
(b) Work out the height of the bar for the class $20 < m \leq 40$.

Mass, m (g)	Frequency
$0 < m \leq 5$	10
$5 < m \leq 15$	?
$15 < m \leq 20$	3
$20 < m \leq 40$	28