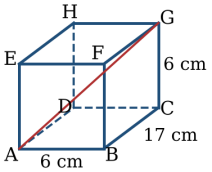
Day 36	S Tier 10-a-day

1 In one country, income tax is worked out like this:
The first £15,000 of income is not taxed.
The next £25,000 is taxed at 10%.
All income above that is taxed at 30%.
Gareth pays £12,850 in income tax in a year.
Work out Gareth's income for the year.

2 The diagram shows a cuboid ABCDEFGH.
(Calculator)
(a) Work out the length of the diagonal AG.
(b) Work out the angle between AG and the base ABCD, to 1 decimal place.
The diagram is not drawn accurately.



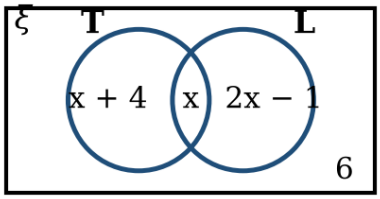
3 The lengths of the sides of a right-angled triangle are (x + 1) cm, (x + 8) cm and (x + 10) cm.
The longest side is (x + 10) cm.
(a) Show that $x^2 - 2x - 35 = 0$
(b) Hence work out the area of the triangle.

4 Rationalise the denominator of $\frac{8}{3\sqrt{5}}$
Give your answer in its simplest form.

5 Prove algebraically that the sum of the squares of any three consecutive integers is always 2 more than a multiple of 3.

Day 36 **S Tier 10-a-day**

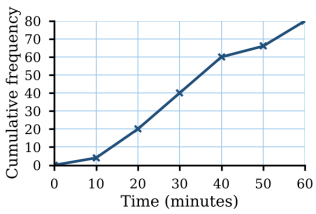
6 The Venn diagram shows how many of 25 students have a tablet (T) or a laptop (L).
(a) Work out the value of x.
(b) A student is chosen at random from those who have a laptop. Work out the probability that this student also has a tablet.



7 Make u the subject of $v = \frac{3u + 3}{u - 5}$

8 In a group of visitors, 25% are adults and the rest are children.
30% of the adults and 45% of the children buy a souvenir.
What percentage of all the visitors buy a souvenir?

9 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 15.



10 The graph of y = f(x) has a maximum point at (−2, 3).
Write down the coordinates of the turning point of the graph of
(a) y = f(x) − 2
(b) y = f(x − 4) + 2