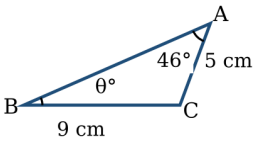
Day 205	S Tier 10-a-day

1 The diagram shows triangle ABC. (Calculator)
Angle BAC = 46° and angle ABC is acute.
Work out the size of angle ABC, marked θ.
Give your answer correct to 1 decimal place.
The diagram is not drawn accurately.



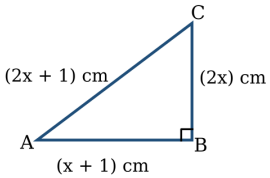
2 (a) Show that the equation $x^2 - 7x - 7 = 0$ can be rearranged to give $x = 7 + \frac{7}{x}$ (Calculator)

(b) Use the iteration formula $x_{n+1} = 7 + \frac{7}{x_n}$ with $x_0 = 7$ to work out x_1 and x_2. Give each answer correct to 3 decimal places.

3 Rationalise the denominator of $\frac{27}{3\sqrt{2}}$
Give your answer in its simplest form.

4 The ratio of red to blue marbles in a jar is 7 : 8.
Then $\frac{2}{3}$ of the red and $\frac{3}{4}$ of the blue are taken out.
Work out the ratio of red to blue now.

5 ABC is a right-angled triangle with sides (x + 1) cm, (2x) cm and (2x + 1) cm. The longest side is (2x + 1) cm.
(a) Find the value of x.
(b) Work out the area of the triangle.
The diagram is not drawn accurately.



Day 205 **S Tier 10-a-day**

6 The price of a coat is increased by 40%.
Later the new price is reduced by 40% in a sale.
The sale price is £218.40.
Work out the price before the increase.
(Calculator)

7 $f(x) = \frac{x + 7}{2x - 1}$ where $x \neq \frac{1}{2}$
(a) Show that $ff(x) = x$.
(b) Write down $f^{-1}(x)$.

8 In a group of members, 60% are juniors and the rest are seniors.
25% of the juniors and 60% of the seniors play chess.
What percentage of all the members play chess?

9 The table gives information about the masses of some eggs.
An estimate for the mean is 53.
Work out the value of x.

Mass, m (g)	Frequency
$10 < m \leq 30$	4
$30 < m \leq 50$	12
$50 < m \leq 70$	x
$70 < m \leq 90$	6

10 A car was bought for £800.
Each year its value decreases by the same percentage.
After 2 years it is worth £288.
Work out the percentage decrease each year.