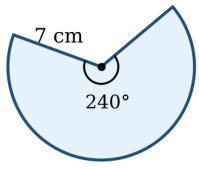
Day 322 **A Tier 10-a-day**

1 (a) A flight takes off at 6:40 pm. The journey takes 3 hours 44 minutes. Work out the time it ends.
(b) Change 150 minutes into hours. Give your answer as a decimal.

2 $\mathbf{a} = \begin{pmatrix} -2 \\ 0 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -4 \\ 1 \end{pmatrix}$.
Work out $3\mathbf{a} - 1\mathbf{b}$.

3 Light travels at 3×10^5 kilometres per second.
The Sun is 9.6×10^7 kilometres from Earth.
Work out how many seconds light takes to travel from the Sun to Earth.
Give your answer in standard form.

4 The diagram shows a sector of a circle of radius 7 cm.
Work out the area of the sector.
Give your answer in terms of π.
The diagram is not drawn accurately.



5 Solve $3^x = \frac{1}{3}$

Day 322 **A Tier 10-a-day**

6 Here are the first five terms of a quadratic sequence.
15, 33, 59, 93, 135
(a) Find an expression for the nth term.
(b) Work out the 10th term.

7 y is inversely proportional to $\sqrt{x}$.
When x = 100, y = 12.
(a) Find a formula for y in terms of x.
(b) Work out the value of y when x = 25.

8 Make x the subject of $y = \frac{3x + 2}{2x + 6}$

9 A bag contains red counters and blue counters in the ratio 2 : 5.
15 more red counters are added to the bag.
The ratio of red counters to blue counters is now 9 : 10.
How many counters were in the bag at the start?

10 A, B, C and D are points on a circle. AC and BD meet at E.
Angle BAC = 35° and angle ACD = 59°.
Work out the size of angle x (angle AEB).
Give reasons for your working.

