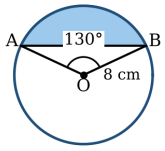
Day 212	S Tier 10-a-day

1 The ratio of juniors to seniors in a school is 2 : 3.
60% of the juniors and 55% of the seniors play a sport.
What percentage of all of these students play a sport?

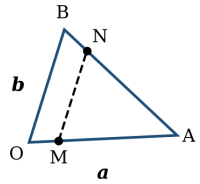
2 A flight leaves London at 09:15 (London time).
It takes 8 hours 15 minutes.
When it is 12:00 in London it is 07:00 in New York.
At what time, in New York time, does the flight land? Say if it is on a different day.

3 The circle has centre O and radius 8 cm. A and B are points on the circle and angle AOB = 130°. (Calculator)
Work out the area of the shaded segment. Give your answer correct to 3 significant figures.
The diagram is not drawn accurately.



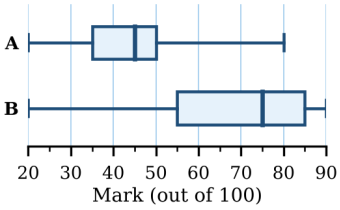
4 Work out $1\frac{1}{2} \times 1\frac{2}{3} - 1\frac{4}{5}$
Give your answer as a mixed number or a fraction in its simplest form.

5 OAB is a triangle. OA = **a** and OB = **b**.
M is on OA with OM : MA = 1 : 4. N is on AB with AN : NB = 4 : 1.
(a) Find ON in terms of **a** and **b**.
(b) Show that MN is parallel to OB.
The diagram is not drawn accurately.



Day 212 **S Tier 10-a-day**

6 The box plots show the test marks of the students in two classes, A and B.
(a) Work out the interquartile range for each.
(b) Compare the distributions of A and B.



7 x is an acute angle and $\tan x = \frac{7}{12}$.
(a) Find the exact value of sin x.
(b) Find the exact value of cos x. Give each answer as a fraction or a surd with a rational denominator.

8 Simplify fully $\frac{x^2 + 2x - 3}{x^2 - 4x} \times \frac{x^2 + 2x}{x - 1}$

9 A rectangle has area $(10 + 6\sqrt{3})$ cm^2 and length $(2 + \sqrt{3})$ cm.
Find the width of the rectangle.
Give your answer in the form $a + b\sqrt{3}$

10 Solve the simultaneous equations
$x^2 + y^2 = 50$
$y = 3x + 10$