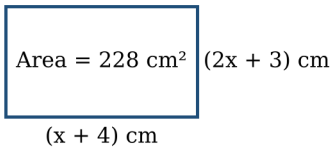
Day 153 **S Tier 10-a-day**

1 In triangle PQR, side QR is extended to S.
Angle QPR = (4x + 15)°
Angle PQR = (2x − 10)°
Angle PRS = (4x + 37)°
(a) Work out the value of x.
(b) Work out the size of angle PRQ.

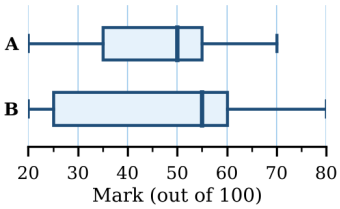
2 A flight leaves London at 12:40 (London time). It takes 10 hours 40 minutes.
When it is 12:00 in London it is 07:00 in New York.
At what time, in New York time, does the flight land? Say if it is on a different day.

3 Sparkle Cleaners has a call-out fee of £3.50 plus £6 per hour.
Fresh Start has a call-out fee of £56 plus £2.50 per hour.
(a) Work out the number of hours for which the two costs are the same.
(b) Which is cheaper for 20 hours, and by how much?

4 The diagram shows a rectangle of length (x + 4) cm, width (2x + 3) cm and area 228 cm^2.
(a) Show that $2x^2 + 11x - 216 = 0$.
(b) Work out the length of the diagonal of the rectangle. Give your answer correct to 3 significant figures.

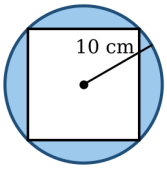


5 The box plots show the test marks of the students in two classes, A and B.
(a) Work out the interquartile range for each.
(b) Compare the distributions of A and B.



Day 153 **S Tier 10-a-day**

6 The diagram shows a square inside a circle of radius 10 cm.
The four vertices of the square lie on the circle.
Work out the area of the shaded region. Give your answer in terms of π.



7 The probability that a bus is more than 5 minutes late on any morning is $\frac{1}{20}$.
Events on different occasions are independent.
Work out the smallest number of mornings needed so that the probability of this happening at least once is greater than 0.5. (Calculator)

8 The table gives information about 72 lengths.
Work out an estimate for the median.
Assume the values in each class are evenly spread.

Length, l (cm)	Frequency
$20 < l \leq 30$	27
$30 < l \leq 40$	15
$40 < l \leq 50$	4
$50 < l \leq 60$	11
$60 < l \leq 70$	15

9 Find the smallest positive integer k such that 54 ÷ k is a square number.

10 $f(x) = \frac{-3x - 2}{3x + 3}$ where $x \neq -1$
(a) Show that ff(x) = x.
(b) Write down $f^{-1}(x)$.