**Day 132** **S Tier 10-a-day**

**1** The table shows the number of students in each of four groups.
(a) A stratified sample of 25 is taken. Work out how many come from Year 9.
(b) A different stratified sample has 8 from Year 10. Work out the size of this sample.

| | Year 7 | Year 8 | Year 9 | Year 10 |
|---|---|---|---|---|
| Number | 110 | 30 | 70 | 40 |

**2** In triangle PQR, side QR is extended to S.
Angle QPR = (2x + 5)°
Angle PQR = (x + 25)°
Angle PRS = (x + 58)°
(a) Work out the value of x.
(b) Work out the size of angle PRQ.

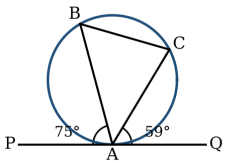
**3** 9 machines can make a batch of bolts in 30 hours.
After 6 hours, 3 of the machines leave. The rest carry on working at the same rate.
How many more hours does it take to finish?

**4** (a) Solve $8 - 2x \geq 2$
(b) n is an integer. Write down all the values of n that satisfy
$5 \leq 2n + 3 \leq 11$

**5** Convert the recurring decimal $0.9\dot{2}\dot{0}$ to a fraction.
Give your fraction in its simplest form.

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**6** PAQ is a tangent to the circle at A. B and C are points on the circle. Angle PAB = 75° and angle CAQ = 59°.
(a) Work out the size of angle ABC.
(b) Work out the size of angle ACB.
The diagram is not drawn accurately.




**7** A bag contains 5 red counters, 6 blue counters and 1 green counter.
Two counters are taken at random without replacement.
Work out the probability that (a) both are the same colour, (b) exactly one is green.

**8** A rectangle has length 25 cm and width 6 cm. Both measurements are correct to the nearest centimetre.
Evan says that the area of the rectangle could be exactly 150 $cm^2$.
Is Evan correct? You must show your working.

**9** Prove algebraically that $m^3 + 11m$ is a multiple of 6 for all integer values of m.

**10** ABC is a right-angled triangle with sides (2x − 1) cm, (x + 2) 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.

