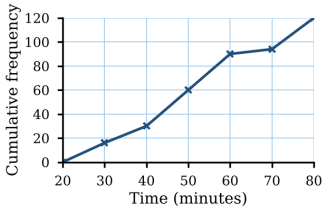
**Day 343** **S Tier 10-a-day**

**1** The cumulative frequency graph gives information about the times of 120 students to complete a puzzle.
(a) Find an estimate for the median and the interquartile range.
(b) Estimate how many of the 120 had a time greater than 55.




**2** Solve the simultaneous equations
$-5x + 4y = 12$
$-x + 2y = 0$

**3** The ratio of juniors to seniors in a school is 1 : 4.
15% of the juniors and 80% of the seniors play a sport.
What percentage of all of these students play a sport?

**4** Solve $9^{x-2} = 81^{x+2}$

**5** A runner covers 100 metres, correct to the nearest 10 metres, in a time of 14.9 seconds, correct to 1 decimal place. (Calculator)
Work out the upper bound of the runner's average speed in metres per second. Give your answer correct to 3 significant figures.

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| **6** A bag contains 2 yellow cubes, 2 white cubes and 4 black cubes.<br>Two cubes are taken at random without replacement.<br>Work out the probability that (a) at least one is yellow, (b) both are the same colour. | |
| **7** The HCF of two numbers is 6 and their LCM is 264.<br>One of the numbers is 66.<br>Work out the other number. | |
| **8** Solve $3x^2 + 7x - 8 = 0$<br>Give your answers in surd form. | |
| **9** A point A is on level ground in line with the base of a lighthouse. (Calculator)<br>The angle of elevation of the top of the lighthouse from A is 41°.<br>B is a point on the same line, 30 m further from the lighthouse than A.<br>The angle of elevation of the top of the lighthouse from B is 21°.<br>Work out the height of the lighthouse. Give your answer to 1 decimal place. | |
| **10** a = 4.2, b = 2.8 and c = 4.6, all correct to 1 decimal place.<br>Work out the upper bound of $\frac{a+b}{c}$.<br>Give your answer correct to 3 significant figures. | |