Day 312 **S Tier 10-a-day**

1 The table shows the number of members in each of four groups.
(a) A stratified sample of 33 is taken. Work out how many come from Group B.
(b) A different stratified sample has 33 from Group A. Work out the size of this sample.

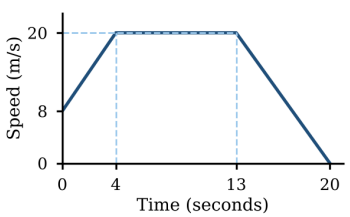
	Group A	Group B	Group C	Group D
Number	220	140	80	220

2 A flight leaves London at 08:15 (London time). It takes 11 hours 45 minutes.
When it is 12:00 in London it is 20:00 in Tokyo.
At what time, in Tokyo time, does the flight land? Say if it is on a different day.

3 Expand and simplify $(x + 2)(x + 6)(x - 2)$

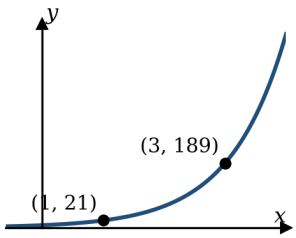
4 A rectangle has length 30 cm and width 11 cm. Both measurements are correct to the nearest centimetre.
Kofi says that the area of the rectangle could be exactly 351 cm^2.
Is Kofi correct? You must show your working.

5 The graph shows the speed of a car during 20 seconds.
(a) Work out the acceleration during the first 4 seconds.
(b) Work out the average speed over the whole 20 seconds.

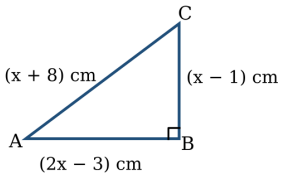


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6 The diagram shows the graph of $y = ka^x$, where k and a are constants and $a > 0$.
The curve passes through the points (1, 21) and (3, 189).
Find the value of k and the value of a.



7 ABC is a right-angled triangle with sides (2x − 3) cm, (x − 1) cm and (x + 8) cm. The longest side is (x + 8) cm.
(a) Find the value of x.
(b) Work out the area of the triangle.
The diagram is not drawn accurately.



8 The value of a house is increased by 20% in one year.
The next year its value is decreased by 5%.
The next year its value is increased by 8%.
It is now worth £147,744.
Work out the value of the house before the first change.

9 ABCD is a rectangle with AB = 5 cm and AD = 8 cm.
A point P inside the rectangle is such that AP ≤ 2 cm and P is nearer to AB than to AD.
Work out the area of the region in which P can lie. Give your answer in terms of π.

10 The point P(8, 5) lies on the graph of y = f(x).
Write down the coordinates of the image of P on the graph of
(a) y = f(−x) (b) y = f(x) − 5