Probability 2H Assessment | THE ANSWERS

Higher Level   All questions
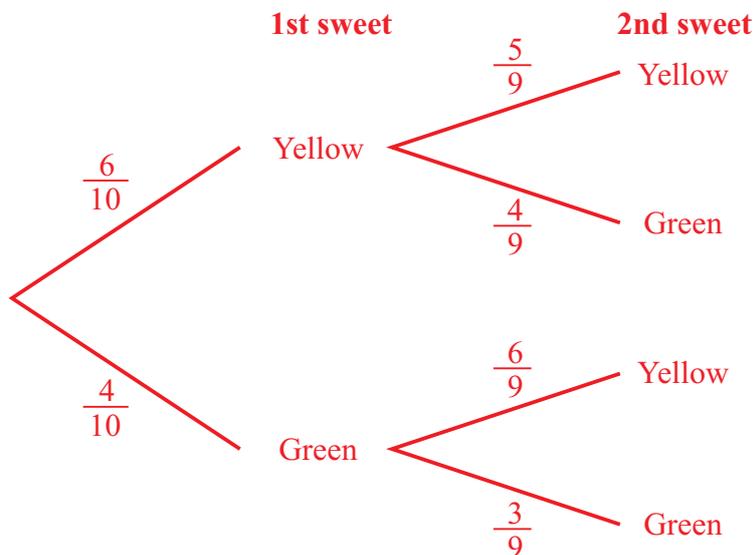
Clip	Grade	Title of clip	Question(s)	Marked out of	Score	%
175	5	Harder Tree Diagrams	1	6	___	__
176	5	Stratified Sampling	2	4	___	__
185	6	Probability using Venn Diagrams	3	6	___	__
186	6	Cumulative Frequency	4	5	___	__
187	6	Boxplots	5	5	___	__
204	7	And and Or Probability Questions	6 - 7	8	___	__
205	7	Histograms	8 - 9	10	___	__

Out of 44   TOTAL SCORE _____

Final Percentage [   ] %

1) There are 6 yellow sweets and 4 green sweets in a bag.

Penny takes a sweet, at random, from the bag and eats it.

She then takes another sweet, at random, and eats it.

a) Draw a tree diagram in the space below to show all the possibilities.

1st sweet   **2nd sweet**

$\dfrac{6}{10}$ Yellow

$\dfrac{5}{9}$ Yellow

$\dfrac{4}{9}$ Green

$\dfrac{4}{10}$ Green

$\dfrac{6}{9}$ Yellow

$\dfrac{3}{9}$ Green

3

b) What is the probability that Penny ate two green sweets? $\dfrac{12}{90}$ **1**

c) What is the probability that Penny ate two sweets of the same colour? $\dfrac{42}{90}$ **2**

2) The table gives information about the numbers of students in the two years of a college course.

|	**Male**	**Female**
First Year	350	705
Second Year	264	216

Phil wants to interview some of the students.

He takes a random sample of 80 students stratified by year and gender.

a) Work out the number of students in the sample who are **female** and in the **first year**.

37 **2**

b) Work out the number of **male** students in the sample.

32 **2**

3) There are 60 students studying in the Science department of a college.

All 60 students study at least one of the sciences - Biology, Chemistry and Physics.

7 of the students study all 3 sciences.

12 of the students study Biology and Chemistry.

21 of the students study Biology and Physics.

20 of the students study Chemistry and Physics.

32 students study Biology.

42 students study Physics.

a) Draw a Venn diagram to show this information. **3**
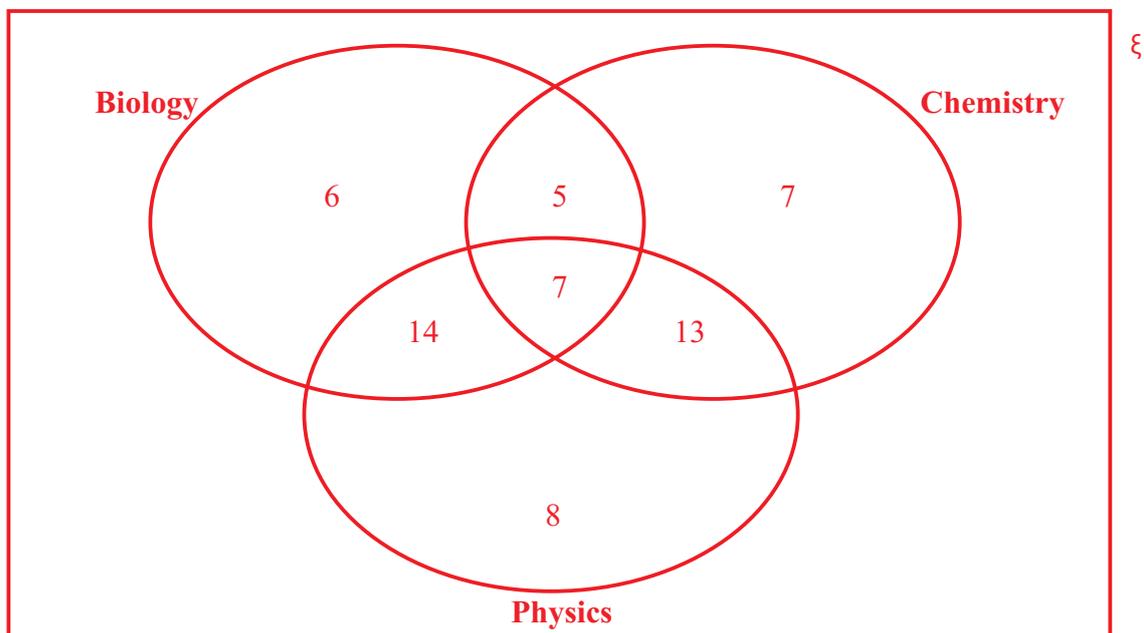
b) One of the 60 students is selected at random.

Find the probability that the student studies Physics but not Chemistry. _____$\frac{22}{60}$_____ **1**

Given that the student studies Chemistry

c) find the probability that this student also studies Biology. _____$\frac{12}{32}$_____ **2**

4)   The table shows some heights of some plants.

a) Draw a cumulative frequency graph to represent the data.

Height in cm (h)	Frequency	Cumulative Frequency
$0 < h$ 10	3	3
$10 < h$ 20	7	10
$20 < h$ 30	14	24
$30 < h$ 40	23	47
$40 < h$ 50	12	59
$50 < h$ 60	5	64
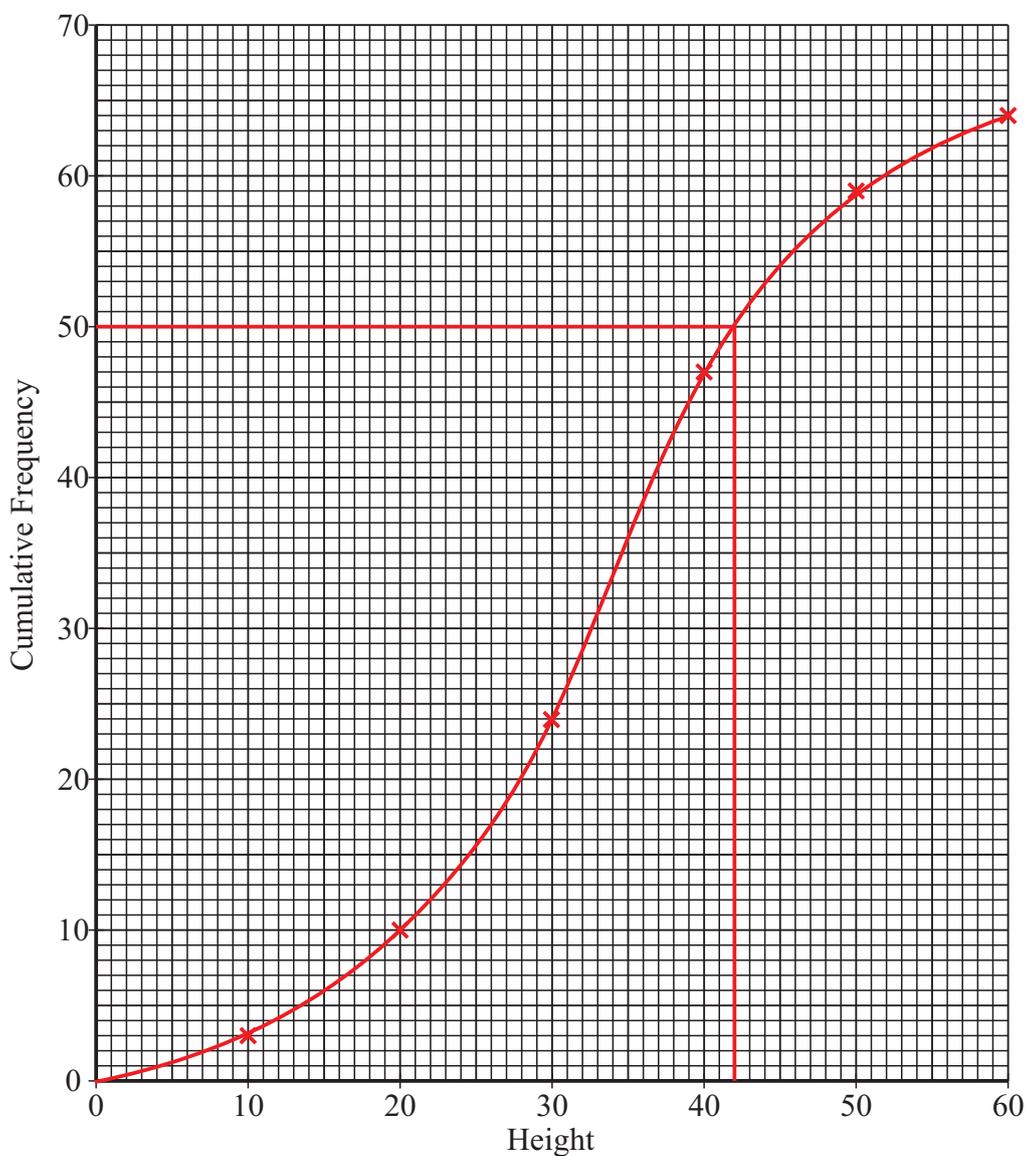
3

b) Use your graph to estimate the number of plants with a height of more than 42 cm. ____14____   **2**

5) Class A and class B took a Maths test.

In class A

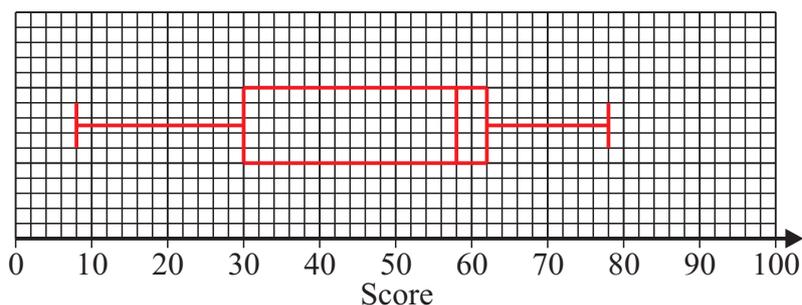25% of the class scored less than 30 marks

50% of the class scored less than 58 marks

the inter-quartile range of the scores was 32 marks
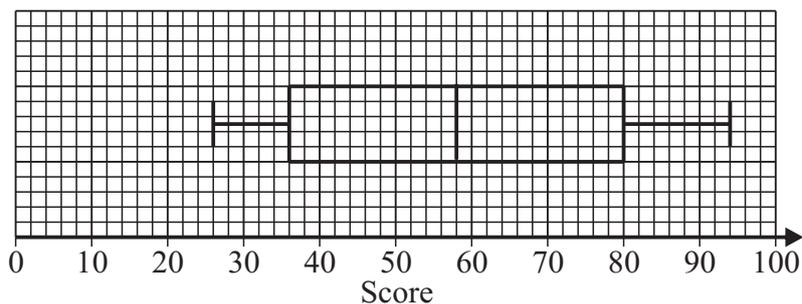
the highest mark was 78

the range was 70 marks.

a) Show the information on a boxplot.

3

Score

The boxplot for class B is shown below.

Score

b) Give one similarity and one difference between the **distributions** of the scores for class A and class B.

Similarity _They both have the same median of 58 marks._

Difference _The interquartile range is greater for class B._

2

6) Julio has to pass through two sets of traffic lights on his way to work.

The probability that the first set of traffic lights will be on red is 0.3

The probability that the second set of traffic lights will be on red is 0.6

What is the probability that **at least** one of the sets of traffic lights is on red?

0.72 **3**

7) Maria is playing a game.

She rolls a fair dice.

If the dice lands on 1 or 2, then she scores 1 point.

If the dice lands on 3 or 4 or 5, then she scores 2 points.

If the dice lands on 6, then she scores -1 point.

Maria rolls the dice twice.

a) What is the probability that she will have a total score of 2 points?
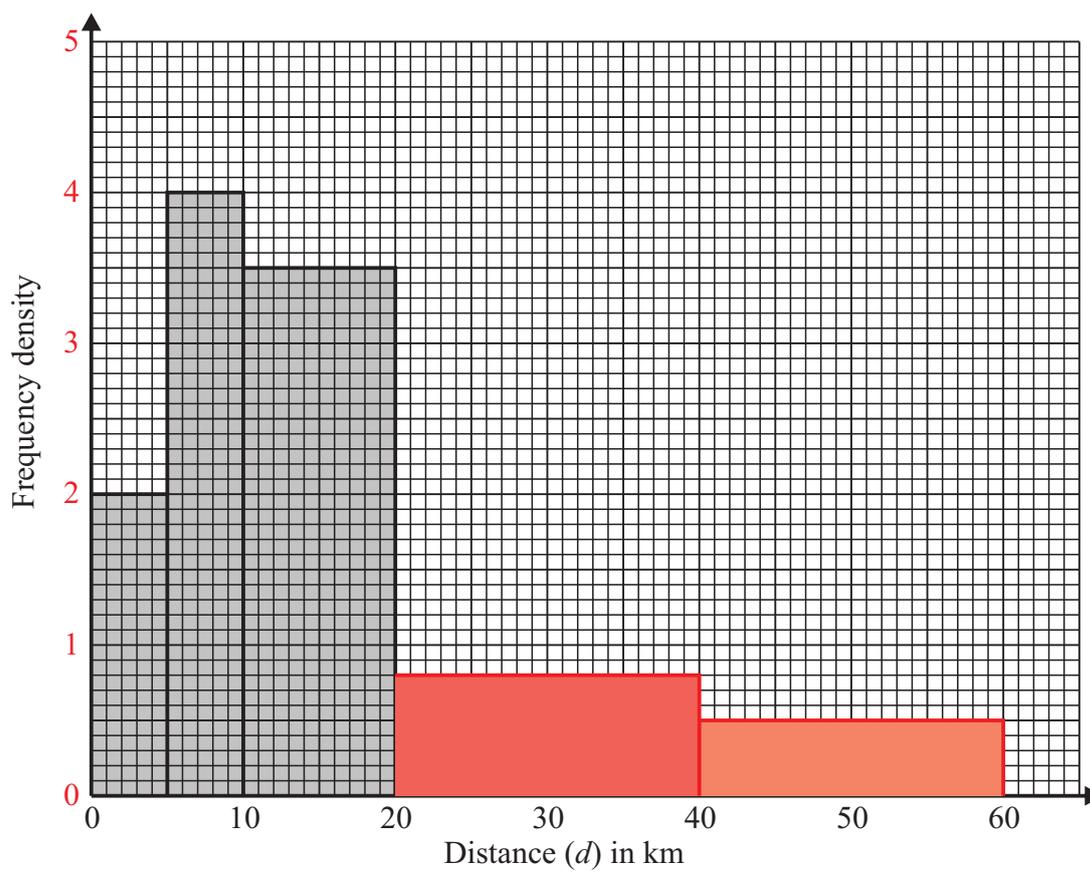
$\dfrac{4}{36}$ **2**

Maria starts again. This time she rolls the dice 3 times.

b) What is the probability that she will have a total score of 3 points?

$\dfrac{35}{216}$ **3**

8) The incomplete histogram and table give some information about the distances some employees travel to work.

Distance (d) in km

Distance (d) in km	Frequency	Frequency Density
$0 < d$ 5	10	2
$5 < d$ 10	20	4
$10 < d$ 20	35	3.5
$20 < d$ 40	16	0.8
$40 < d$ 60	10	0.5

a) Use the information in the histogram to complete the table. **2**

b) Use the information in the table to complete the histogram. **3**

9) The histogram represents the heights of plants, in cm, at a garden centre.

Height (h) in cm
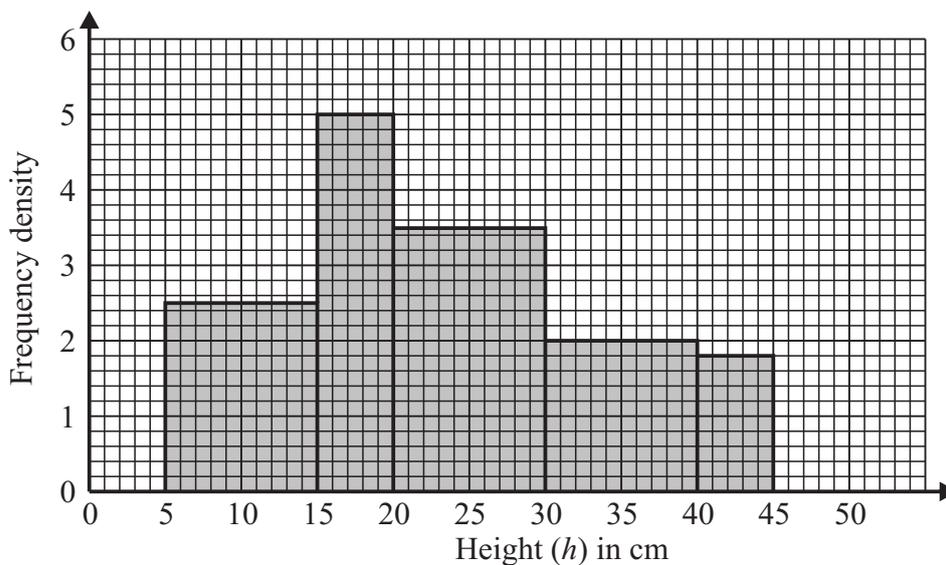
Calculate an estimate for the mean height of plant.

Height (h) cm	Frequency Density	Frequency	Midpoint	Frequency × midpoint
5 < h 15	2.5	25	10	250
15 < h 20	5	25	17.5	437.5
20 < h 30	3.5	35	25	875
30 < h 40	2	20	35	700
40 < h 45	1.8	9	42.5	382.5
		114		2645

2645 ÷ 114 = 23.2

23.2

5