| Probability 1H Assessment | **THE ANSWERS** |

Higher Level   All questions

Clip	Grade	Title of clip	Question(s)	Marked out of	Score	%
57	2	Frequency Trees	1	3	___	__
58	2	Listing Outcomes	2	4	___	__
59	2	Calculating Probabilities	3	2	___	__
60	2	Mutually Exclusive Events	4	4	___	__
61	2	Two-Way Tables	5	5	___	__
62	2	Averages and the Range	6 - 7	11	___	__
63	2	Data - Discrete and Continuous	8	4	___	__
64	2	Vertical Line Charts	9	5	___	__
65	2	Frequency Tables and Diagrams	10	6	___	__
125	3	Experimental Probabilities	11	4	___	__
126	3	Possibility Spaces	12	4	___	__
127	3	Venn Diagrams	13	6	___	__
128	3	Pie Charts	14	3	___	__
129	3	Scatter Diagrams	15	4	___	__
130a	3	Averages from a Table - Basics	16	6	___	__
130b	3	Averages from a Table - Estimate for Mean	17	7	___	__
151	4	Simple Tree Diagrams	18	6	___	__
152	4	Sampling Populations	19	5	___	__
153	4	Time Series	20	4	___	__

Out of 93   TOTAL SCORE _____
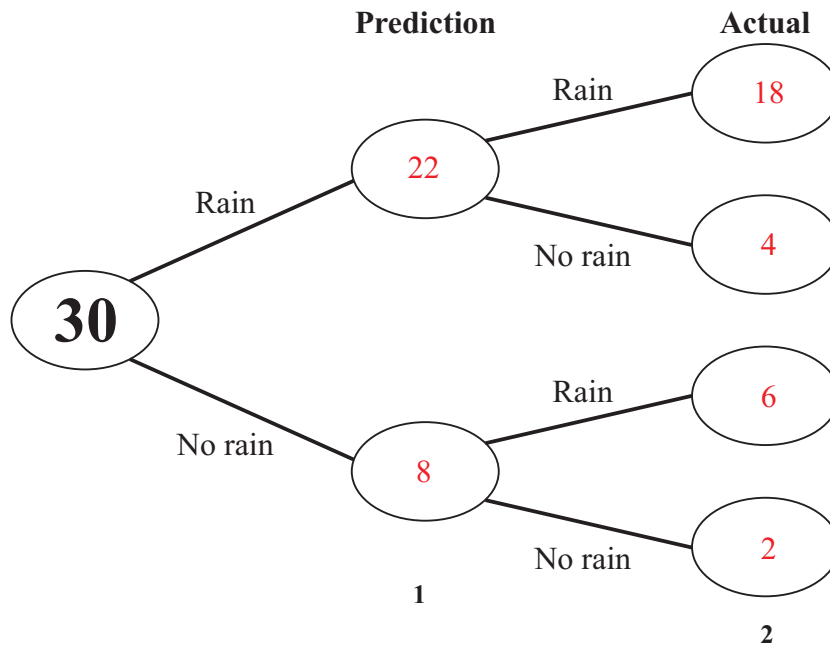
Final Percentage [   ] %

1) There are 30 days in April.

It is predicted that it will rain on 22 of them.

Of the days when it is predicted to rain, it actually rains on 18 of them.

It rains on 24 days in total in April.

Complete the frequency tree.

2) Alex has 3 coins in his pocket - 1p, 50p and 20p.

Julie also has 3 coins in her pocket - 2p, 10p and 5p.

They each take one coin out of their pocket.

a) How many possible outcomes are there? ___9___   **1**

b) List all of the possible outcomes, the first one has been done for you:

1p + 2p, 1p + 10p, 1p + 5p, 50p + 2p, 50p + 10p, 50p + 5p, 20p + 2p, 20p + 10p, 20p + 5p   **3**

3) There are 15 sweets in a bag.

9 are toffees and the rest are mints.

A sweet is chosen from the bag at random.

Work out the probability that it is a mint. ___$\frac{6}{15}$___   **2**

4) A bag contains buttons of four different colours.

A button is taken from the bag at random.

The table below shows some of the probabilities of taking each colour of button.

Colour	Red	Black	Blue	Brown
Probability	0.06	0.5	0.12	0.32

a) Complete the table.   **2**

b) What is the probability that a red or black button is taken from the bag? ___0.56___   **2**

5) 50 students were asked which method of transport they most often use to travel to school.

The two-way table shows some information about their answers.

	Walk	Cycle	Car	Bus	Total
Male	6	6	2	9	23
Female	6	2	9	10	27
Total	12	8	11	19	50

23 of the students are male.

9 of these male students take the bus.

Of the 8 students that cycle, 2 are female.

a) Complete the two-way table.   **3**

b) What is the probability that a student, chosen at random, walks to school? ___$\frac{12}{50}$___   **2**

6) Rajesh wrote down the times that 10 people took to run 100 metres.

The times, in seconds, were: 21.3, 19.5, 22.7, 16.5, 25.2, 18.7, 20.9, 19.5, 27.4, 24.3

a) What was the mean time? ___21.6 seconds___   **2**

b) What was the median time? ___21.1 seconds___   **2**

c) What was the modal time? ___19.5 seconds___   **1**

d) What was the range of the times? ___10.9 seconds___   **2**

7) Five integers have

a mode of 5

a median of 7

a mean of 10

a range of 15.

Work out what the five integers are. __5__ __5__ __7__ __13__ __20__ **4**

8) Decide whether each of these sets of data is **discrete** or **continuous**.

a) Heights of sunflowers. _____Continuous_____ **1**

b) Number of seeds in a packet. _____Discrete_____ **1**

c) Amount of people in a queue. _____Discrete_____ **1**

d) Weight of fertiliser in a bag. _____Continuous_____ **1**

9) The line graph shows the number of pets owned by the pupils in a class.
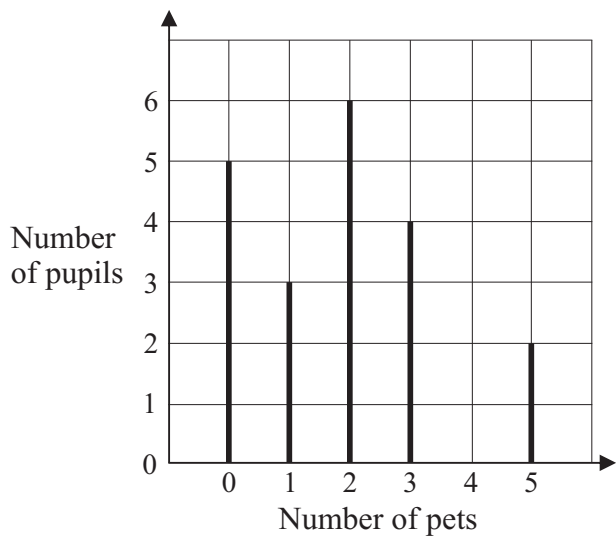
a) What is the modal number of pets? ____2____ **1**

b) How many pets were owned by the pupils in the class altogether? ____37____ **2**

c) What was the mean number of pets? ____1.85____ **2**

10) A factory that packs cheese suspects that one of its weighing machines is faulty.

Twenty packs of cheese weighed by this machine are re-weighed. The packs are labelled '200g'.
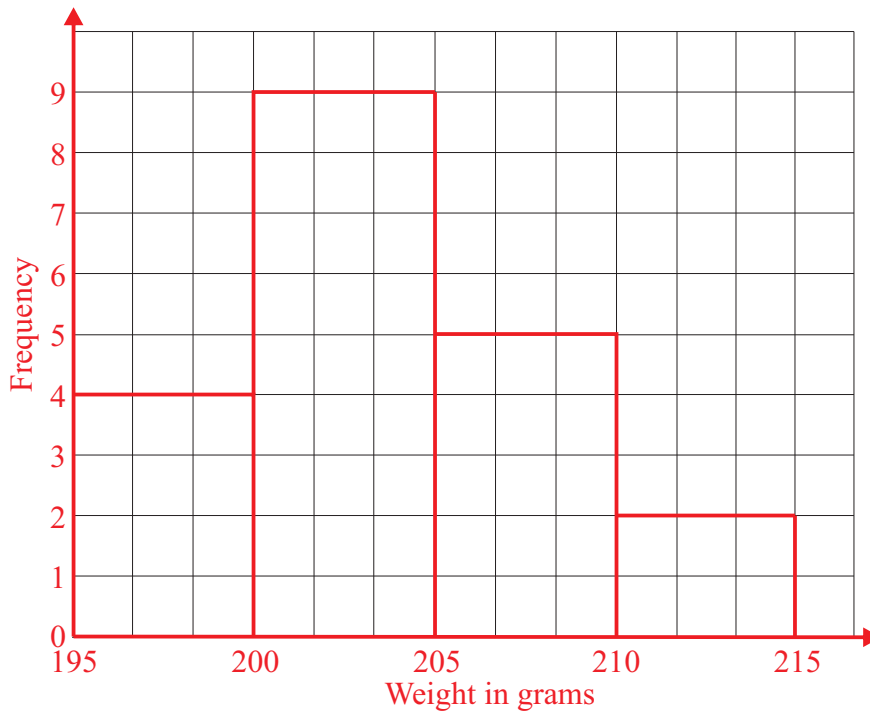
The weights, in grams, are:

205	206	199	200	198
200	200	207	210	200
211	201	197	200	205
200	199	208	200	200

a) Complete the frequency table for this data.

Weight in grams (w)	Tally	Frequency
195 $w < 200$	||||	4
200 $w < 205$	|||| ||||	9
205 $w < 210$	||||	5
210 $w < 215$	||	2

3

b) Draw a frequency diagram to represent this data.

3

11) Alice, Bob and Chloe each note whether it rains or not each day for a number of days.

The table shows their results.

	Number of days	Number of days rain
Alice	10	3
Bob	50	16
Chloe	100	36

a) Bob says: 'As it can either rain or not rain, the probability of it raining is 0.5'.

Criticise his statement.

Bob is incorrect.

The probability of it raining depends on lots of factors, such as time of year, and is not 0.5 **1**

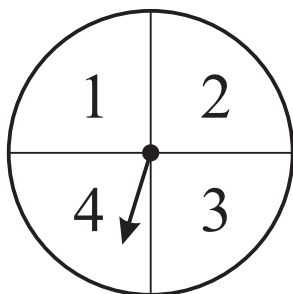b) Whose results give the best estimate of it raining on any given day?

Explain why.

Chloe's.

She has the most trials. **2**

c) What is the best estimate for the probability of it raining on any given day? $\frac{36}{100}$ **1**

12) A game is played with a fair spinner.

The player spins the spinner **twice**.

The score is the total of the two numbers.

a) Complete the possibility space to show the scores.

First spin

Second spin		1	2	3	4
	1	2	3	4	5
	2	3	4	5	6
	3	4	5	6	7
	4	5	6	7	8

2

b) You win a prize if you score 5.

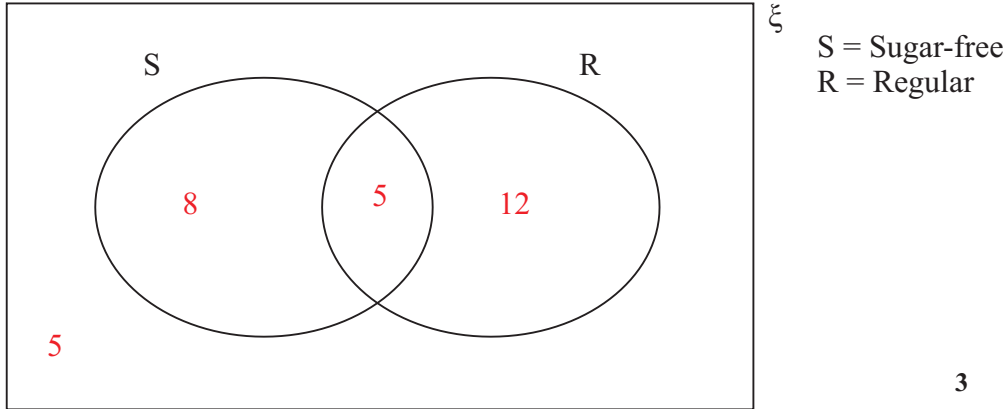What is the probability of winning a prize? $\frac{4}{16}$ **2**

13) 30 pupils were asked what kind of soda they drank - sugar-free or regular.

17 of the 30 pupils drank regular soda.

13 of the 30 pupils drank sugar-free soda.

5 of the 30 pupils did not drink soda.

a) Complete the Venn diagram to show this information.

ξ

S = Sugar-free
R = Regular

3

b) How many pupils are included in:
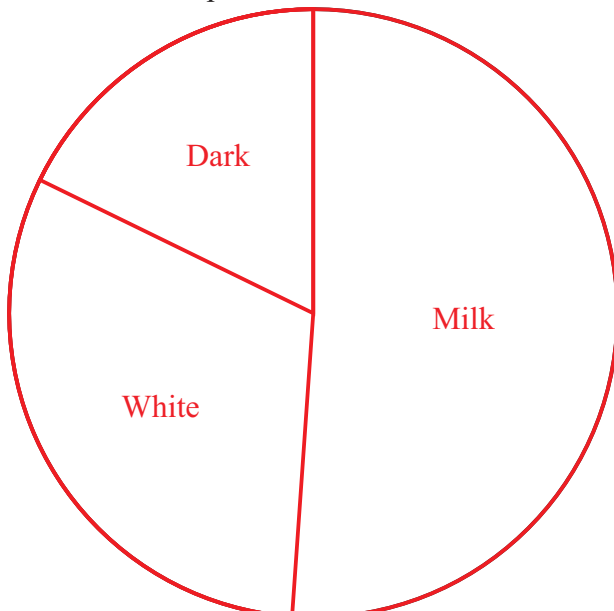
i) S ∩ R; _____5_____ **1**

ii) S' ∪ R? _____22_____ **2**

14) Gary asked some people what their favourite type of chocolate was.

The table shows his results.

Chocolate	Frequency	Angle
Milk	46	184°
White	28	112°
Dark	16	64°

Draw an accurate pie chart to show these results.

3

15) The scatter graph shows the number of scarves sold in a shop each day against the temperature at midday that day.
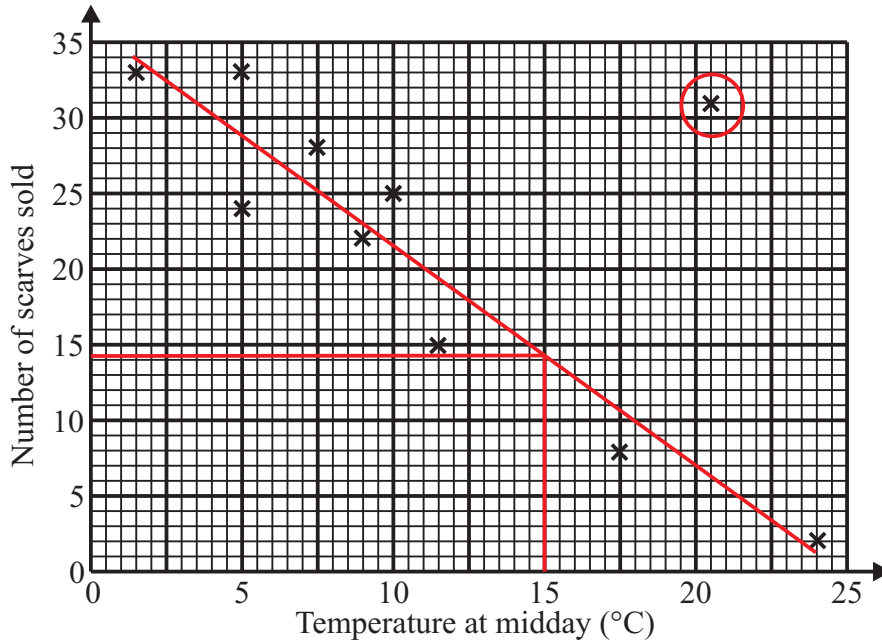
a) Describe the relationship between the temperature at midday and the number of scarves sold.

Negative correlation

1

b) On one day, the shop had a special clearance sale on scarves.

On the graph, circle the data point that you think represents this day.

1

c) Use a line of best fit to predict the number of scarves that the shop may sell when the temperature at midday is 15°C. _____14_____

2

16) Peter keeps chickens. Every day for a month he counted the number of eggs that they laid.

The results are shown in the table.

Number of eggs	Number of days
4	4
5	10
6	8
7	6
8	3

a) What was the modal number of eggs laid? _____5_____ **1**

b) What was the mean number of eggs laid? _____5.8_____ **3**

c) What was the median number of eggs laid? _____6_____ **2**

17) Diana weighs the eggs laid by her chickens.

The results are shown in the table.

Weight in grams (w)	Number of eggs
45 $w < 50$	4
50 $w < 55$	5
55 $w < 60$	12
60 $w < 65$	7
65 $w < 70$	3

a) Which is the modal group? _____55 $w < 60$_____   **1**

b) In which group does the median lie? _____55 $w < 60$_____   **1**

c) Explain why we cannot calculate an accurate value for the mean from this data.

Because the data is given in groups.

We don't know all the individual values of the data.

_____   **2**

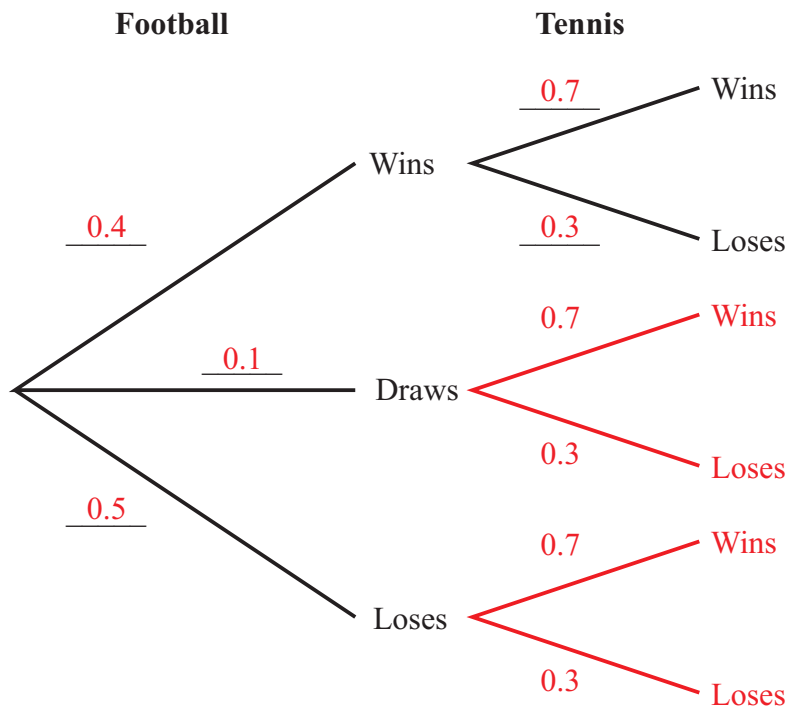d) Calculate an estimate for the mean.

_____57.5_____   **3**

18) Mario plays one game of football, followed by one game of tennis.

The probability that Mario's team wins at football is 0.4 and the probability that they draw is 0.1.

The probability that Mario wins at tennis is 0.7.

a) Complete the probability tree diagram.

Football   **Tennis**

Wins — 0.4

0.7 → Wins

0.3 → Loses

Draws — 0.1

0.7 → Wins

0.3 → Loses

Loses — 0.5

0.7 → Wins

0.3 → Loses

3

b) What is the probability that Mario loses at least one game? ___0.65___   **3**

19) In Katy's year 7 class there are 32 students. 8 of them have a cat.

There are 1440 students in the school in total.

a) Use this information to estimate the number of students in the school that have a cat. ___360___ **2**

b) Ali says that using just Katy's class is not a good sample.

Suggest two ways to improve the sample.

  Make the sample bigger. **1**

  Include students from different year groups. **1**

c) Describe a method that Ali could use to select a better sample of students.

  Assign each student in the school a random number and then use a random number

  generator to pick students,   OR

  put names in a hat and pick some out at random. **1**

20) The total sales of mobile phones are recorded every 3 months for 3 years by a phone company.

The results are shown in the table.

Month	Sales (nearest 1000)
March 2012	4000
June 2012	3000
September 2012	5000
December 2012	7000
March 2013	6000
June 2013	5000
September 2013	6000
December 2013	9000
March 2014	7000
June 2014	6000
September 2014	8000
December 2014	10000

a) Draw a time series graph of this data.   **3**
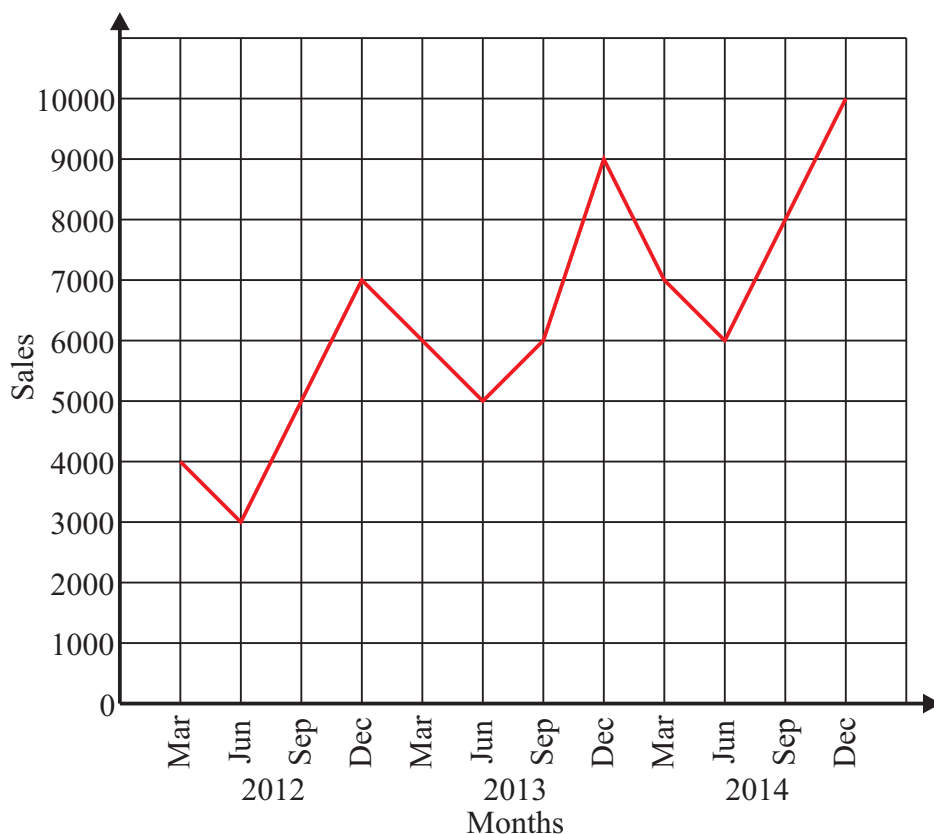
b) Comment on the trend.

Upwards trend

1