# Probability 1H Assessment

## 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 | ___ | __ |

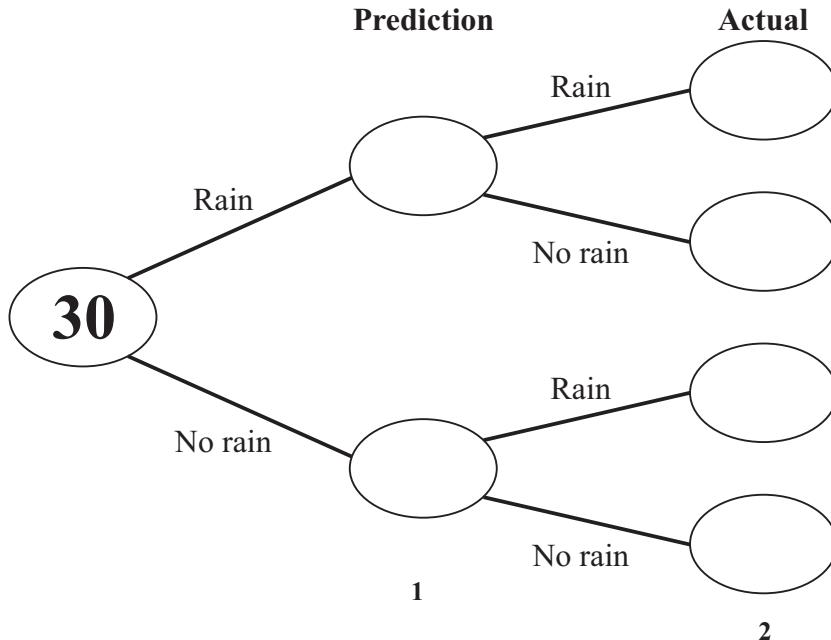*Out of 93*          TOTAL SCORE  _____

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? _____ **1**

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

**1p + 2p**, _____ **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. _____ **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 | | 0.32 |

a) Complete the table.          **2**

b) What is the probability that a red or black button is taken from the bag? _____          **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 | | | | |
| Female | | | 9 | | |
| Total | | | | 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? _____          **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? _____

b) What was the median time? _____

c) What was the modal time? _____

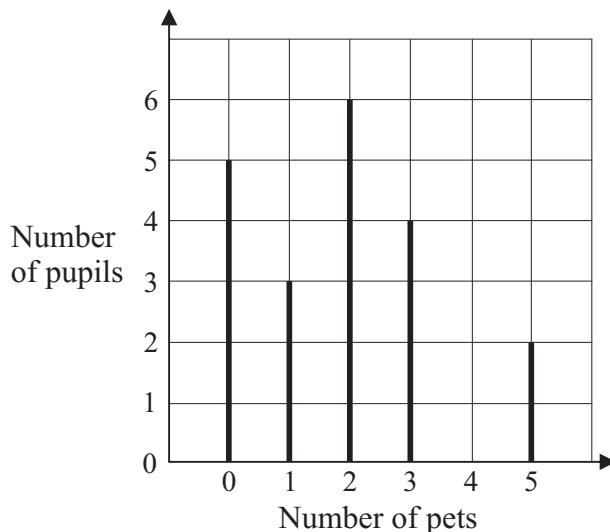d) What was the range of the times? _____

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. _____  _____  _____  _____  _____  **4**


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

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

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

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

d) Weight of fertiliser in a bag.   _____ **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? _____ **1**

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

c) What was the mean number of pets? _____ **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'.
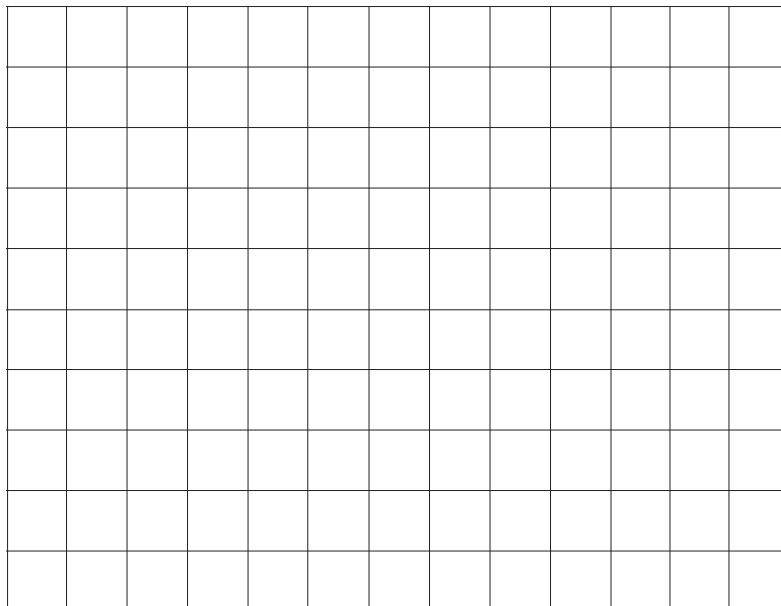
The weights, in grams, are:

| | | | | |
|---|---|---|---|---|
| 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    $w < 200$ | | |
| 200    $w < 205$ | | |
| 205    $w < 210$ | | |
| 210    $w < 215$ | | |

**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'.
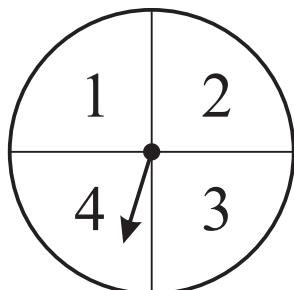
Criticise his statement.

_____

_____ **1**

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

Explain why.

_____

_____ **2**

c) What is the best estimate for the probability of it raining on any given day? _____ **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

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **1** | | | 4 | |
| **2** | | | | |
| **3** | | 5 | | |
| **4** | | | | |

Second spin **2**

b) You win a prize if you score 5.

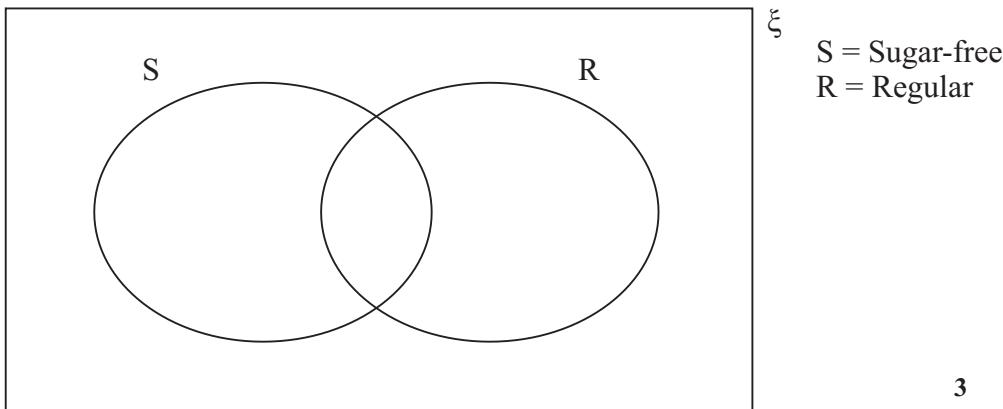What is the probability of winning a prize? _____ **2**

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:
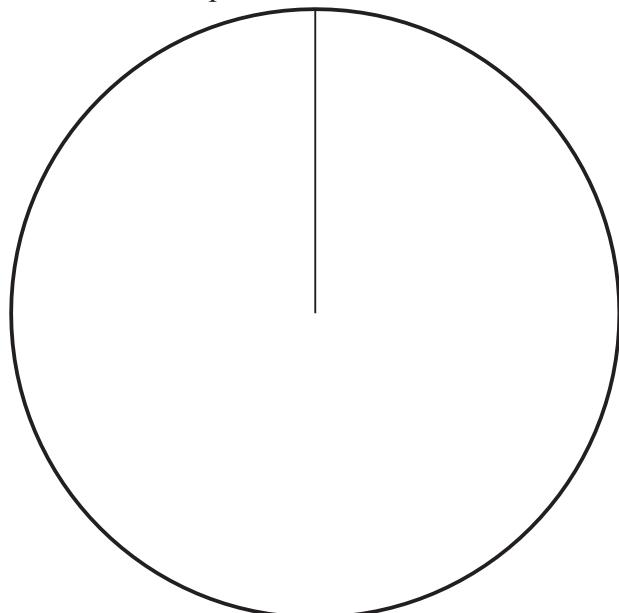
i)　　S ∩ R; _____　　**1**

ii)　　S' ∪ R? _____
　　　　　　　　　　　**2**

14) Gary asked some people what their favourite type of chocolate was.
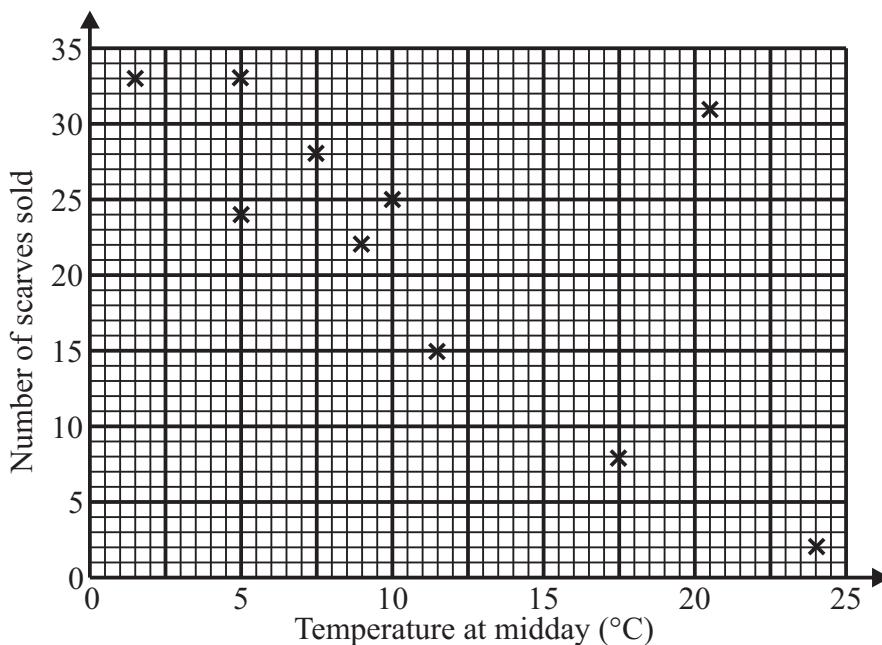
The table shows his results.

| Chocolate | Frequency | |
|-----------|-----------|--|
| Milk | 46 | |
| White | 28 | |
| Dark | 16 | |

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.



Temperature at midday (°C)

a) Describe the relationship between the temperature at midday and the number of scarves sold.

_____ **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. _____ **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? _____ **1**

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

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

17) Diana weighs the eggs laid by her chickens.

The results are shown in the table.

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

a) Which is the modal group? _____  **1**

b) In which group does the median lie? _____  **1**

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

_____

_____

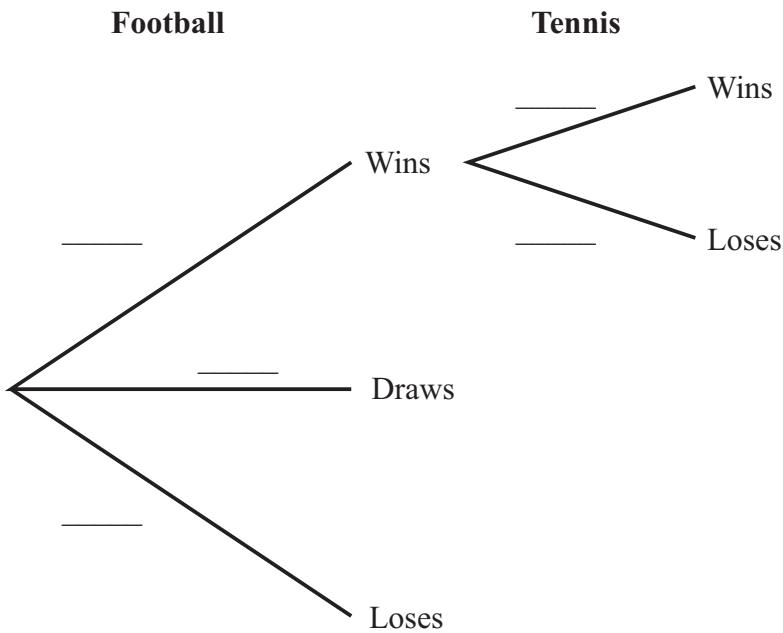_____  **2**

d) Calculate an estimate for the mean.

_____  **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
                        Wins <
                              _____  Loses

        _____
              
    ○ ←  _____   _____  Draws


        _____

              Loses
```

**3**

b) What is the probability that Mario loses at least one game? _____   **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. _____  **2**

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

Suggest two ways to improve the sample.

_____  **1**

_____  **1**

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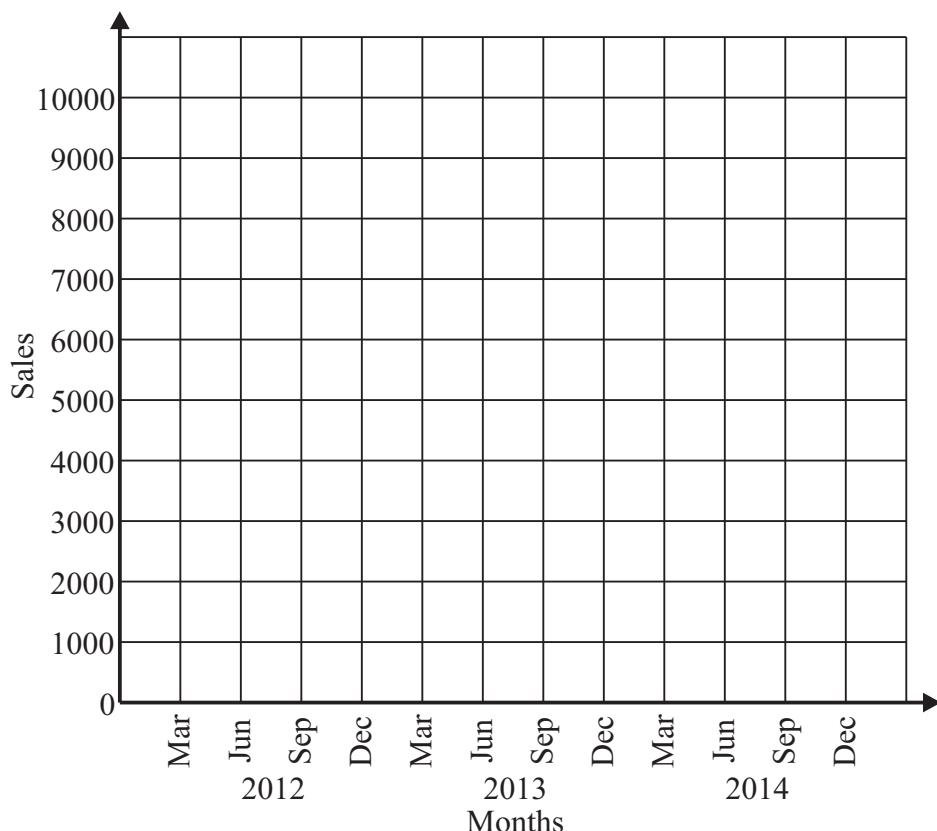
_____

_____

_____  **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.

_____

_____ **1**