**Part 3: Short Answer Questions**

***Question 1***

**Solve each equation with the quadratic formula.**

1. *v*2 +2*v*−8=0 *2)* *k*2 +5*k*−6=0

3) 14*m*2 +1=6*m*2 +7*m 4)* 4*x*2 +4*x*−8=1

***Question 2***

**Sketch the graph of each function.**

A graphing of equations and equations

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A graphing of a function

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***Question 3***

**Please complete the table and draw a pie chart based on the table**

A table with numbers and question marks

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***Question 4***

a) Draw a bar chart for this frequency table using the axis provided. Ensure you label your axes.

|  |  |
| --- | --- |
| **Age** | **Freq** |
| 11-15 | 3 |
| 16-20 | 6 |
| 21-25 | 2 |
| 26-30 | 7 |

b) Why technically are we using a bar chart and not a histogram?

***Question 5***

The sum of five consecutive integers is equal to 140. What is the smallest of the five integers?

***Question 6***

Three different positive integers have a mean of 7. What is the largest positive integer that could be one of them?

***Question 7***

Here is the weight of 15 cats:

4.5kg 4.9kg 5.2kg 3.9kg 4.1kg  
 5.0kg 3.6kg 4.9kg 5.3kg 4.3kg  
 7.4kg 3.6kg 5.3kg 3.8kg 5.3kg

(a) Produce an ordered stem and leaf diagram to show this information.

(b) What is the median weight?

(c) What is the mode weight?

***Question 8***

Sam collects the weights of 15 squirrels and puts them into weight ranges. His data is presented below. **Estimate the mean weight of a squirrel.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Weight** | 10-16kg | 16-20kg | 20-30kg | 30kg-32kg |
| **Frequency** | 7 | 3 | 4 | 1 |

***Question 9***

Miss Clarke values a number of pieces of artwork in the Tiffin School Vault. The price ranges are summarised below. **Estimate the average value of a piece of art in school.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Value** | £0-£1000 | £1 000-5 000 | £5 000-£20 000 | £20 000-£100 000 |
| **Frequency** | 10 | 25 | 6 | 1 |

***Question 10***

Draw a labelled Histogram for each set of data. Ensure this is done accurately! Remember to think carefully about how you label the x-axis…

Money Spent in a clothes shop.

|  |  |  |
| --- | --- | --- |
| Money Spent (£) | Frequency | Frequency Density |
| 0 ≤ £ < 20 | 40 |  |
| 20 ≤ £ < 30 | 50 |  |
| 30 ≤ £ < 40 | 55 |  |
| 40 ≤ £ < 50 | 40 |  |
| 50 ≤ £ < 100 | 50 |  |

***Question 11***

A screenshot of a table

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(b) On the grid on the following page, draw a cumulative frequency graph for your table.

A graph chart with numbers and lines

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***Question 12***

Chart

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***Question 13***

Draw 2 box plots on the same diagram, using the information on the length of time 2 different types of lightbulb last. Then, answer the questions below.

Speedy Light: Ultrabulb:

Lowest Value – 1200 hours Lowest Value – 1050 hours

Lower Quartile – 1500 hours Median – 1400 hours

Median – 1700 hours Upper Quartile – 1900 hours

Upper Quartile – 1800 hours Range – 1100 hours

Highest Value – 2800 hours Interquartile range – 750 hours

1. Draw **2 box** plot for the information given
2. Look at the medians and interquartile ranges – use these to compare the different types of bulb. Which would you be most likely to use and why?
3. What is the probability of a random speedylight bulb lasting more than 1800 hours?

***Question 14***

A diagram of a measurement

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***Question 15*** A white background with black arrows and black text

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***Question 16***

A school cafeteria offers 3 types of sandwiches (ham, turkey, and veggie) and 2 types of drinks (water and soda).

1. If a student randomly selects one sandwich and one drink, what is the probability they choose a turkey sandwich and a soda?
2. The cafeteria is running a promotion where, if a student chooses a ham sandwich, they must choose water. If a student selects a sandwich first, what is the probability they will end up with a ham sandwich and water?
3. The cafeteria runs a simulation by observing the choices of 100 students. They find that 30 students chose a veggie sandwich, and 50 chose soda. Based on this simulation, what is the estimated probability that a randomly chosen student selects a veggie sandwich and a soda?

***Question 17:***

A bag contains 7 red marbles, 5 green marbles, and 3 blue marbles. A student randomly selects two marbles from the bag.

1. What is the probability that both marbles drawn are green if the first marble **is put back into the bag** before drawing the second?

b) What is the probability that both marbles drawn are green if the first marble **is not put back** into the bag before drawing the second?

***Question 18:***

A farmer is planting crops in two fields. Field 1 has a 70% chance of growing wheat and a 30% chance of growing corn. Field 2 has a 60% chance of growing wheat and a 40% chance of growing corn.

1. What is the probability that both fields will grow wheat?
2. If Field 1 grows wheat and this increases the likelihood that Field 2 will also grow wheat to 80%, what is the probability that both fields will grow wheat under this new condition?
3. If the farmer plants crops in 200 fields, how many fields are expected to grow corn based on the original probabilities?