Name: Key
Date: _____ Block: _____

1. The weights of a sample of cooking chickens to the nearest kilogram are:

1.5, 1.8, 1.7, 1.4, 1.7, 1.8, 2.0, 1.5, 1.6, 1.6, 1.9, 1.7, 1.4, 1.7, 1.8, 2.0

(a) Find the mean weight of the chickens.

$(1.5+1.8+1.7+1.4+1.7+1.8+2.0+1.5+1.6+1.6+1.9+1.7+1.4+1.7+1.8+2.0) \div 16 = 1.69375$

$27.1 \div 16 = 1.69375$

$\bar{x} = 1.69$ kg

(b) Find the standard deviation of the weights of the chickens.

$S_x = \sqrt{\frac{\Sigma(x-\bar{x})^2}{n}}$ = on calc $\sigma_x = 0.181895\,4026\ldots$

$\sigma_x = 0.182$

(c) Find the median weight of the chickens.

med = 1.7 kg

1.4 1.4 1.5 1.5 1.6 1.6 1.7 1.7 | 1.7 1.7 1.8 1.8 1.8 1.9 2 2

2. The following times for the 100 metre freestyle were recorded by members of a swimming squad.

32.1	33.0	33.2	33.2	33.7	34.1	34.3	34.4	34.4	34.8	35.0	35.2	35.4	35.7	35.9
35.9	36.7	36.8	36.8	37.0	38.6	39.0	40.1	41.2						

(a) State the lower quartile time.

$Q_1 = \frac{34.1 + 34.3}{2} = 34.2$ sec

(b) State the median time.

$Q_2 = \text{med} = \frac{35.2 + 35.4}{2} = 35.3$ sec.

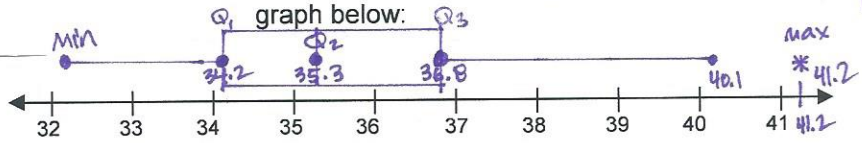
(c) State the upper quartile time.

$Q_3 = \frac{36.8 + 36.8}{2} = 36.8$ sec.

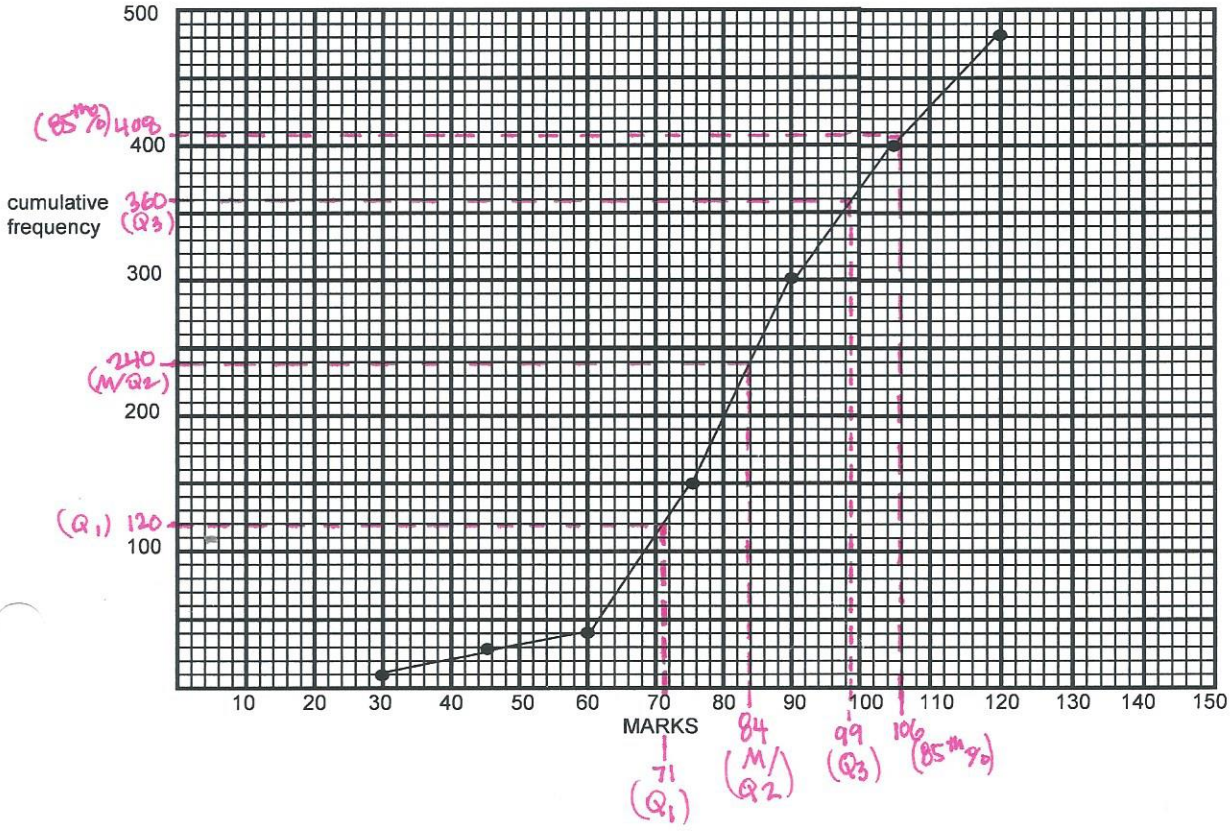
IQR = $Q_3 - Q_1$ = 2.6

LB = 30.3
UB = 40.7
so 41.2 is an outlier

(d) Draw a box and whisker plot of the data using the Q_1 graph below:



3. The marks scored by year 12 students from a cluster of schools in a common trial mathematics exam are displayed in the diagram below:



3. *(continued - use the cumulative frequency diagram from the previous page)*

(a) How many students sat for the examination?

480 students

(b) What is the median mark for the exam? (SHOW THIS ON THE DIAGRAM!!)

$0.5(480) = 240$ → Median Mark = 84

(c) Find the inter-quartile range.

$Q_3 \rightarrow 0.75(480) = 360 \rightarrow$ mark $Q_3 = 99$

$Q_1 \rightarrow 0.25(480) = 120 \rightarrow$ mark $Q_1 = 71$

IQR = 99 − 71 = 28 marks

(d) Give an estimate of the 85th percentile.

$0.85(480) = 408 \rightarrow$ 85th percentile = mark 106

no #4...

5. The table below shows the number and weight (w) of fish delivered to a local fish market one morning.

Weight (kg)	Frequency	Cumulative frequency
$0.50 \leq w < 0.70$	16	16
$0.70 \leq w < 0.90$	37	53
$0.90 \leq w < 1.10$	44	**c** 97
$1.10 \leq w < 1.30$	23	120
$1.30 \leq w < 1.50$	10	130

(a) Write down the value of **c**.

c = 53 + 44 = 97

(b) **On separate graph paper**, draw a cumulative frequency curve for this data. Use a scale of 1 cm to represent 0.1 kg on the horizontal axis and 1 cm to represent 10 units on the vertical axis. Label the axes clearly.

(c) Use the graph to show that the median weight of the fish is 0.95 kg.

$0.5(130) = 65$

(d) If a zoo buys all fish whose weights are above the 90th percentile, how many fish does the zoo buy?

$0.9(130) = 117 \rightarrow 130 - 117 = 13$ or $0.1(130) = 13$

They buy 13 fish.

(e) A pet food company buys all of the fish in the lowest quartile. What is the maximum weight of the fish bought by the company?

$0.25(130) = 32.5$ → approximately 79 kg.

(f) A restaurant buys all fish whose weights are within 10% of the median weight.

$0.1(0.95) = 0.095$

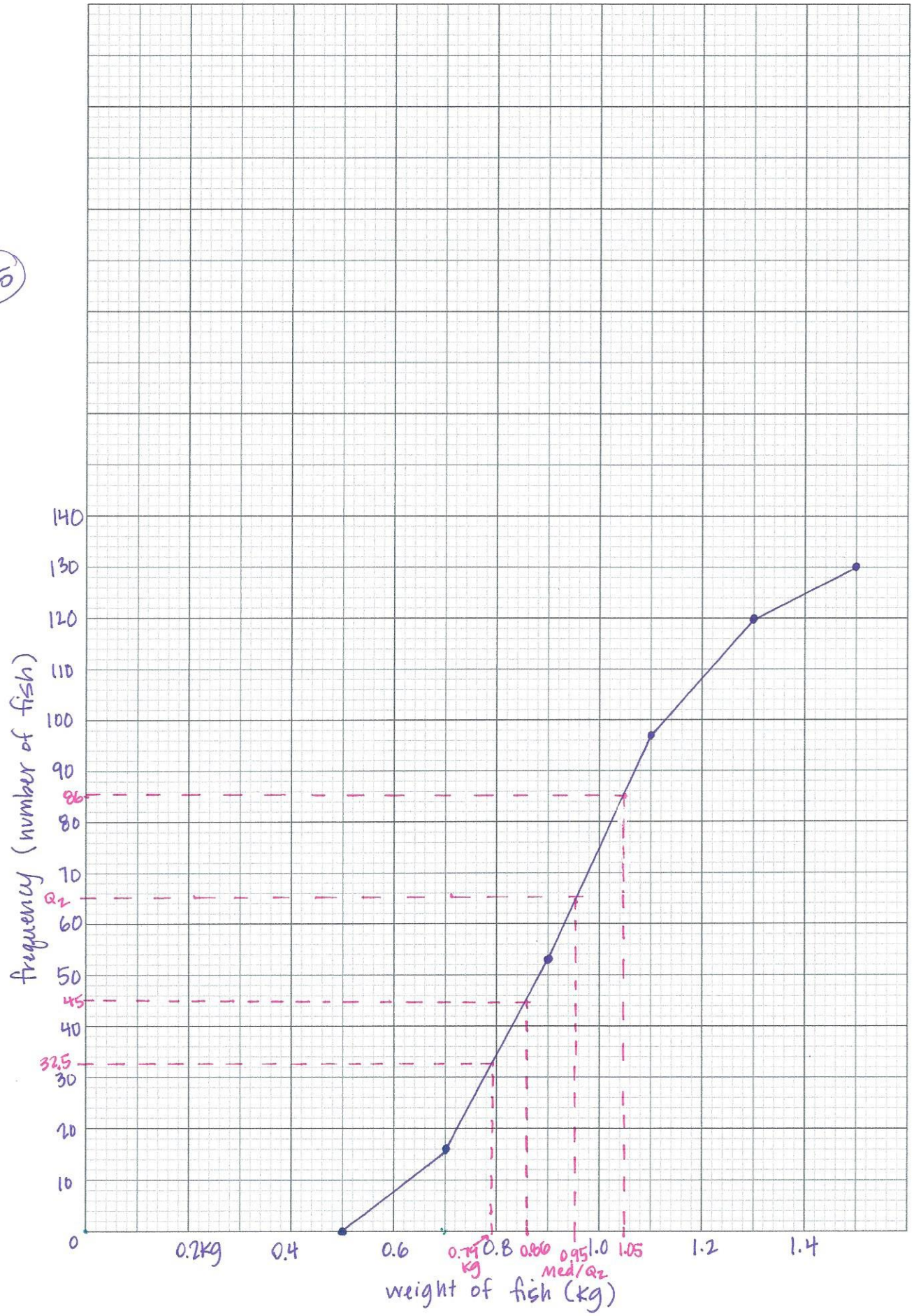
(i) Calculate the minimum and maximum weights for the fish bought by the restaurant.

max: 0.95 + 0.095 = 1.045 kg (1.05) Min: 0.95 − 0.095 = 0.855 kg (0.86)

(ii) Use your graph to determine how many fish will be bought by the restaurant.

86 − 45 = approximately 41 fish

#5


frequency (number of fish)
140
130
120
110
100
90
86
80
70
Q_2
60
50
45
40
32.5
30
20
10
0
0.2kg
0.4
0.6
0.8
0.86
0.95
1.0
1.05
1.2
1.4
med/Q_2
weight of fish (kg)

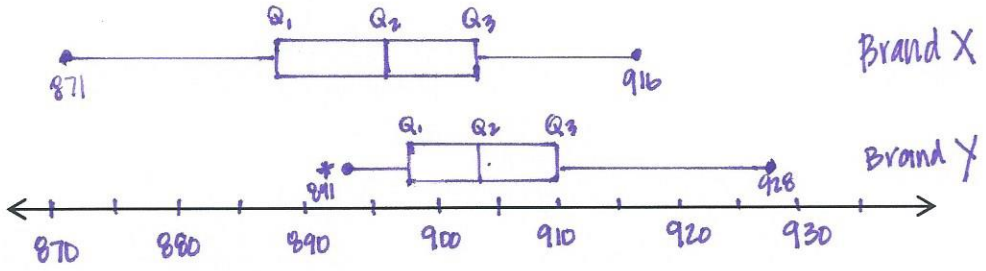
6. The number of peanuts in a jar varies slightly from jar to jar. Samples of 30 jars were taken for each of two brands X and Y, and the number of peanuts in each jar was recorded.

Brand X						Brand Y					
871	885	878	882	889	885	909	906	913	891	898	901
916	913	886	905	907	898	894	894	928	892	924	892
874	904	901	894	897	899	927	907	901	900	907	913
908	901	898	894	895	895	921	904	903	896	901	895
910	904	896	893	903	888	917	903	910	903	909	904

(a) Complete the table:

	Brand X	***Brand Y***
min	871	891
Q_1	888	898
median	896.5	903.5
Q_3	904	910
max	916	928
IQR	16	12

(b) Draw two box-and-whisker plots to display the data.



Brand Y: 891 is an outlier

(c) Use a GDC to determine the standard deviation for each brand of peanuts.

Brand X: 10.9 (10.9162977)

Brand Y: 10.0 (10.0489911)

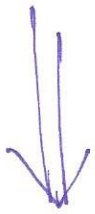
(d) Comment on which brand:

(i) has more peanuts per jar.

Brand Y has more peanuts per jar as the median is greater.

(ii) has a more consistent number of peanuts per jar.

Brand Y has a more consistent number of peanuts per jar. The IQR range is lower, which indicates less variation



7. In the following ordered data set, the mean is 6 and the median is 5: 2, ***b***, 3, ***a***, 6, 9, 10, 12
Find each of the following.

(a) the value of *a*;

$2, b, 3, a, 6, 9, 10, 12$

median $\rightarrow \frac{a+6}{2} = 5 \Rightarrow a+6 = 10$

$\boxed{a = 4}$

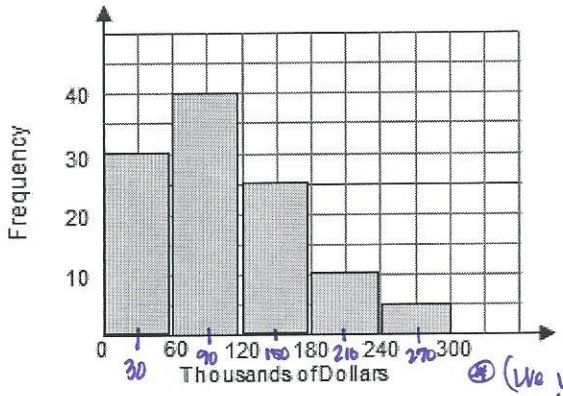
(b) the value of *b*.

$\text{mean} = \frac{2 + b + 3 + 4 + 6, 9, 10, 12}{8} = 6$

$\frac{46+b}{8} = 6 \Rightarrow 46 + b = 48$

$\boxed{b = 2}$

8. The following histogram shows the house prices in thousands of US dollars (USD) of a random sample of houses in a certain town in Virginia.



(We would use the midpoint values to find the mean and/or standard deviation.)

Find the estimated mean of the house prices. 110 houses

(frequencies): 30 + 40 + 25 + 10 + 5

You may also want to use the Chapter 6 Review Sets beginning on page 206 of your text to help prepare for the test.