

Y7 Maths

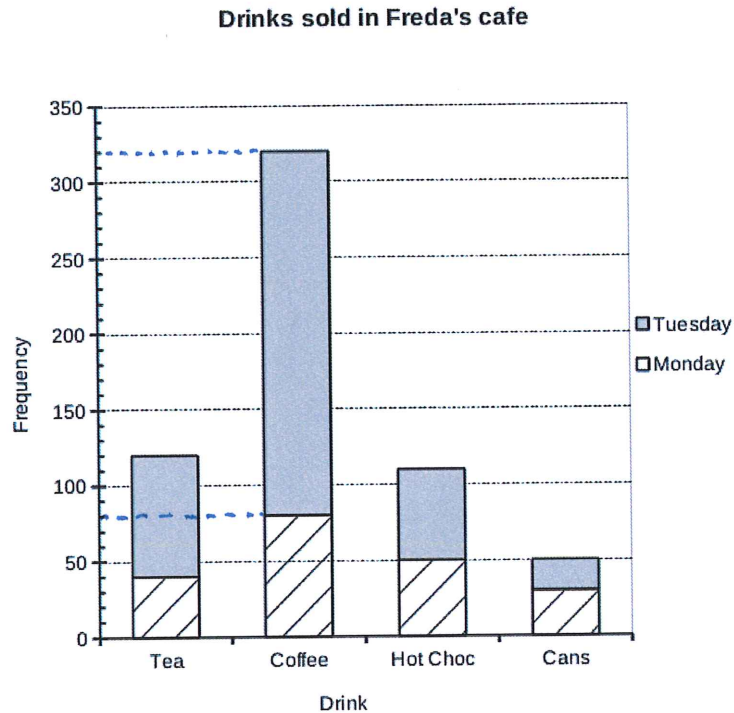
Unit 1 Class Test

Analysing and Displaying Data

Name: MARKSCHEME

CALCULATOR ALLOWED

1. Freda has opened a new café and is interested in how many drinks she is selling and what type. Here is her data from the first two days of business:



- a. What is the name given to this type of bar-chart?

Bi compound

- b. On Monday, which is more popular from the choice of tea or cans?

B1 tea [1]

- c. How many more coffees are sold on Tuesday compared with Monday?

Total coffees sold = 320
Monday = 80

} (B1) for either of these
± 5 coffees

$\Rightarrow$ Tuesday = $320 - 80 = 240$ (MI) for finding TUES

How many more = TUE - MON

160 (Al)

[3]

(Total 5 marks)

2. This partly-completed table shows the favourite sport in a small sports club:

	Athletics	Basketball	Football
Male	11	15	20
Female	15	16	23

a. How many males are there in the club?

(B1) 46
[1]

b. The manager thinks that basketball is more popular with females than with males. Is he correct?
You must fully justify your answer.

Male basketball = $\frac{15}{46} = 32.6\%$ (M1) for attempting to get male and female into a format that can be compared eg %
Female basketball = $\frac{16}{54} = 29.6\%$
(A1) for male avrt 33% and female avrt 30%

(C1) for "No" and a reason which refers to some calculations students have made

KWI: I'm sure there are other ways to answer this question, or indeed interpret it.
Please ask me if unsure.

[3]
(Total 4 marks)

3. The 20m multistage fitness test (MSFT) is a commonly used maximal running aerobic fitness test. It is also known as the 20 metre shuttle run test, beep or bleep test among other names. This test involves continuous running between two lines 20m apart in time to recorded beeps.

The frequency table below shows the beep test fitness results for the eighty-five DC teachers in June. The number of teachers who finished at each level was recorded.

Level	Frequency	
5	29	$5 \times 29 = 145$
6	13	$6 \times 13 = 78$
7	8	$7 \times 8 = 56$
8	17	$8 \times 17 = 136$
9	18	$9 \times 18 = 162$

(85)

(577)

- a. What is the range of the staff's level of fitness?

(31) 4 [1]

- b. Work out the mean level of fitness. (You may use the extra blank column in the table if it helps)

(M1) for $(5 \times 29) + (6 \times 13) + \dots + (9 \times 18)$
candidates are arithmetic error

(M1) for "577" $\div$ 85

awrt (A1) 6.8 [3]

- c. Before the summer holidays, Mr Jones sent all staff an email about the new DC Fitness Standards and the beep test was repeated again in September. Here are the summary statistics:

Range	Mean
3	7.2

Compare the results in June and September, using all summary data and interpreting them in the context of the situation.

(C1) for factual statement eluding to mean has increased from J to Sep
 (C1) " " " " range has decreased " "
 (C1) for interpretation of both mean and range in context
 eg on average the staff have got fitter/better and their scores/levels are more consistent

4. The table shows the Maths Society's favourite ice-cream flavour.

Draw a pie chart for the data.

(you must show working for the angles you calculate)

Flavour	Frequency
Salted Caramel	4
Chocolate	5
Cookies & Cream	7
Strawberry	2

(18)

$$\text{Angle size for one icecream} = 360^\circ \div 18 = 20^\circ$$

or

$$\text{Salted Caramel} = \frac{4}{18} \times 360^\circ = 80^\circ$$

(M1)

Salted Caramel 80°

Chocolate 100°

Cookies & Cream 140°

Strawberry 40°

(A1) must have all 4 correct and
(working seen)

PIE CHART

(A2) all sectors $\pm 2^\circ$
and labelled

or

(A1) all sectors $\pm 2^\circ$ but not labelled

or

(A1) 3 sectors $\pm 2^\circ$ and labelled

(Total 4 marks)

5. Paul recorded the number of camels he saw each day in a week.

2, 32, 4, 2, 4, 0, 6

Which average should he use to best describe the data?

(Explain your answer clearly, justifying why the average you choose is better than the other two averages.)

(C2) ~~for discounting mean and mode~~, and choosing median

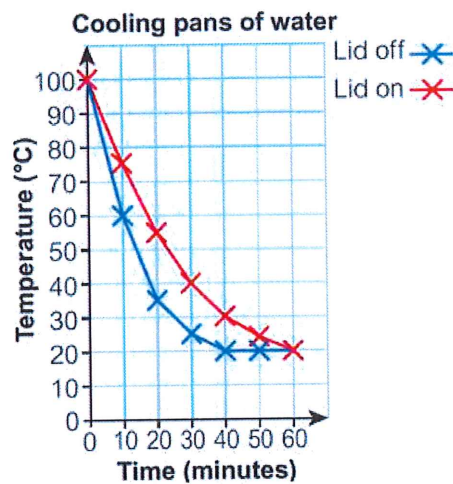
or ~~for discounting mean or mode~~, and choosing median

(C1) eg. there are 2 modes so that's not very useful

the extreme value of 32 will affect/skew the mean,
so I pick the median

(Total 2 marks)

6. Two pans of hot water were left to cool to room temperature. One pan had a lid. The graph shows the recorded temperatures.



- a. What was the temperature of the water in the pan with the lid after 40 minutes?

(B1) 30°C

[1]

- b. Write a sentence to compare the times it took the pans to reach room temperature.

(C1) ~~for statement saying that pan without lid reaches room temp quicker than pan with lid~~, or
(must mention both pans, actual values not necessary)

[1]

- c. What was the difference in the temperature after 20 mins?

55 - 35

(M1) for both numbers $\pm 2^\circ\text{C}$

(A1) 20°C
 $\pm 5^\circ\text{C}$

[2]

(Total 4 marks)

7. Here are the lengths of fifteen new labrador puppies, in cm.

39, 51, 56, 55, 40, 46, 45, 49, 36, 52, 46, 48, 37, 58, 43

a. Complete the tally chart for the data.

Length, L (cm)	Tally	Frequency
$35 \leq L < 40$		3
$40 \leq L < 45$		2
$45 \leq L < 50$		5
$50 \leq L < 55$		2
$55 \leq L < 60$		3

(B2) all rows correct

or

(B1) 3 rows correct

[2]

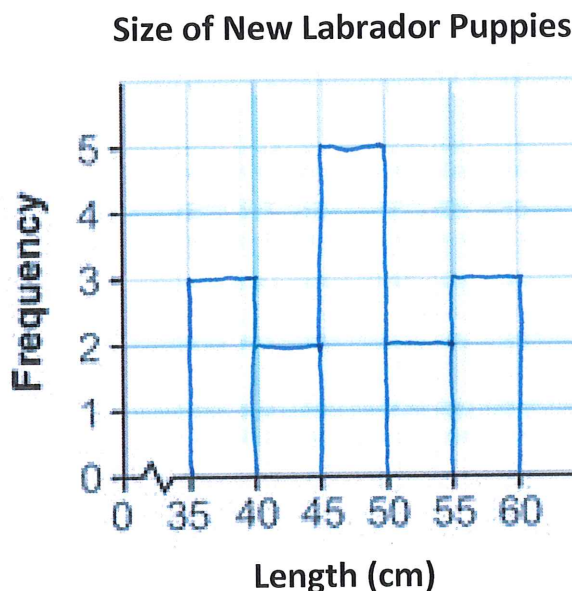
b. What is the modal class?

(B1)

$45 \leq L < 50$

[1]

c. Complete the frequency diagram below for the data.



(B2) all bars correct height, according to their table, and no spaces between the bars

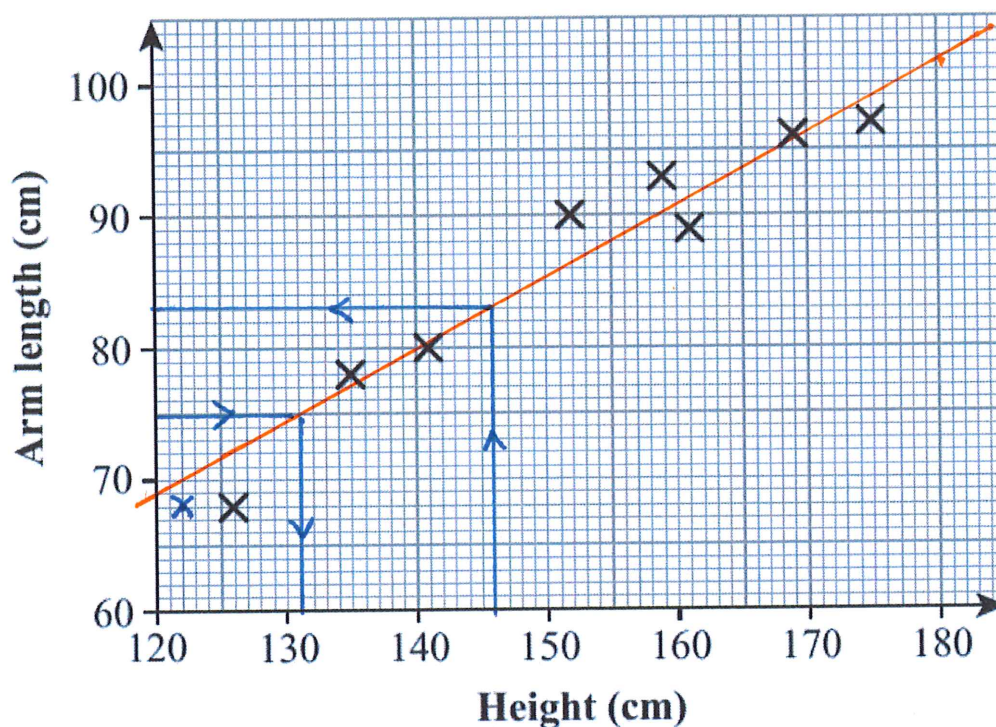
or

(B1) all bars correct height, according to their table, but spaces between the bars

[2]

(Total 5 marks)

8. The scatter graph below shows the arm length and height of some Year 11 students.



- a. One student is not on the graph. Add their data to the graph now: (B1) for cross or dot
Height 122cm. Arm length 68cm.

[1]

- b. Describe the correlation of the data.

positive (correlation) (B1) ignore "weak/strong"

[1]

- c. Draw on the line of best fit

(B1) for a l.o.b.f. that generally has the same no. of points above/below the line

[1]

- d. Estimate:

- i. the arm length of a student who is 146cm tall.

$\pm 2\text{cm}$ (B1) 83cm

- ii. the height of a student who has arm length of 75cm.

$\pm 2\text{cm}$ (B1) 131cm

[2]

(Total 5 marks)