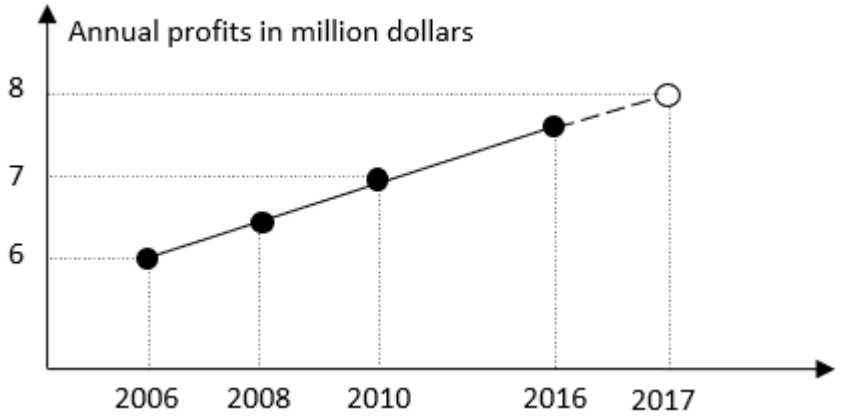
EQUITY
LEARNING PLACE

Elementary Math Topical (Statistics)

Question 1:

The CEO used the following line graph to show the annual profits made by the company over a number years.



State one aspect of the graph that may lead to the wrong projection of the annual profits in 2017. Explain your answer.

The horizontal axis is not proportional. The yearly growth from 2006 to 2010 may not be the same as the growth from 2010 to 2016. From the graph, it shows constant projection from 2006 to 2016 which is not exactly the case which will lead to the wrong projection in 2017.

Question 2:

The mean, median and mode of five numbers are 21.

The range of these five numbers is 34 and the smallest number is 9.

Find the five numbers.

$$9, 11, 21, 21, 43$$

Question 3:

Six different numbers are arranged in ascending order

$$a,\ b,\ c,\ d,\ e,\ f$$

The mean of these numbers is 114, the median is 86, the lower quartile is 36, the interquartile range is 62 and the range is 360.

When the smallest number is removed from the group, the new mean is 135 and the new median is 91.

Find the value of *a*, *b*, *c*, *d*, *e* and *f*.

$d = 91$

$a = 6 \times 114 - 5 \times 135 = 9$

$f = 9 + 360 = 369$

$c = 86 \times 2 - 91 = 81$

$b = 36$

$e = 98$

Question 4:

The lifetimes of 80 Type *A* projector bulbs was measured.

The table below shows the distribution of lifetime of the projector bulbs.

Lifetime (t hours)	Frequency
$2000 < x \leq 3000$	10
$3000 < x \leq 4000$	38
$4000 < x \leq 5000$	28
$5000 < x \leq 6000$	4

a) Calculate an estimate of the mean lifetime.

b) Calculate an estimate of the standard deviation of these lifetimes

c) Type *B* projector bulbs have a mean lifetime of 3955 hours and a standard deviation of 810 hours. Make two comparisons between the lifetimes of Type *A* and Type *B* projector bulbs.

a)

$$\text{Mean} = \frac{2500 \times 10 + 3500 \times 38 + 4500 \times 28 + 5500 \times 4}{10 + 38 + 28 + 4} = 3825$$

b)

$$\text{Standard Deviation} = \sqrt{\frac{2500^2 \times 10 + 3500^2 \times 38 + 4500^2 \times 28 + 5500^2 \times 4}{10 + 38 + 28 + 4} - (3825)^2}$$

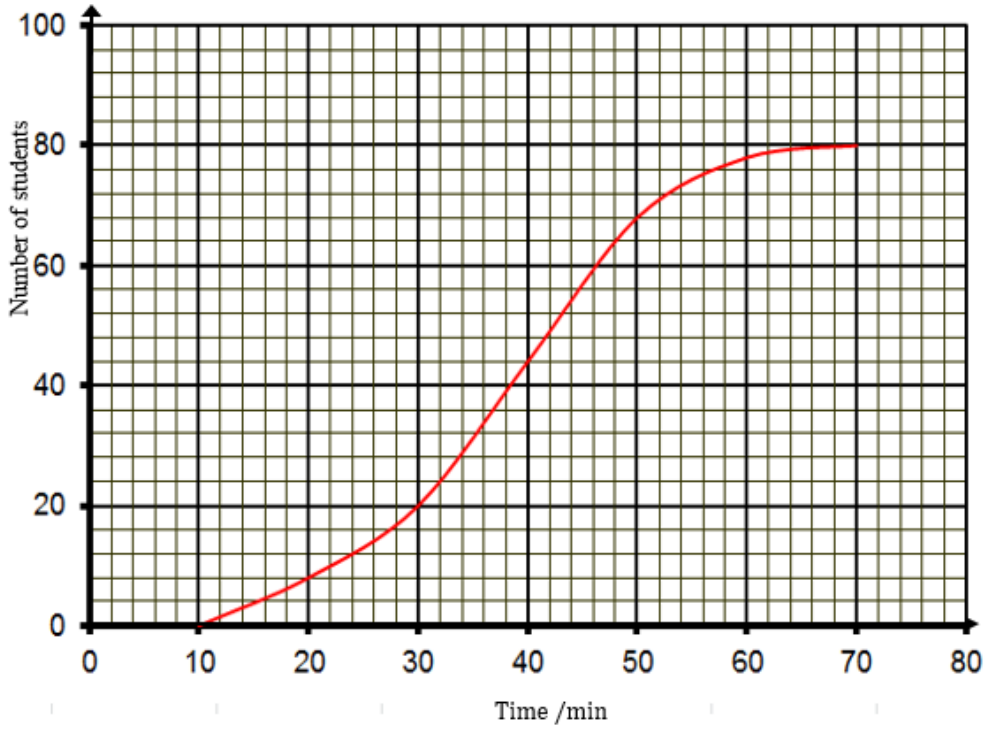
$$= 754.569 \approx 755$$

c) On average, Type B projector bulbs will last longer than Type A projector bulbs because they have a higher mean.

The lifetime of Type B projector bulbs are less consistent than those of Type A projector bulbs because it has a higher standard deviation.

Question 5:

The cumulative frequency curve shows the distribution of the time spent by 80 students on playing online games in school *A*.



Use the graph to estimate

a) the median time spent

b) the interquartile range

The time spent by the students can be represented by a frequency table as shown below

Time Spent (x minutes)	$10 \le x < 20$	$20 \le x < 30$	$30 \le x < 40$	$40 \le x < 50$	$50 \le x < 60$	$60 \le x < 70$
Number of students	8	12	24	n	m	2

c) Find the values of m and n.

d) Calculate an estimate of the mean time spent.

e) Calculate the standard deviation.

f) Find the percentage of students who spent 1 hour or more playing online games

Two students were chosen at random from the 80 students.

g) Calculate the probability that both students spend less than 40 minutes on playing online game.

The time spent on playing online games by 80 students from school *B* had the same interquartile range as the time spent by the 80 students from school *A* but with a higher median value.

h) Describe how the cumulative frequency curve for school *B* will differ from the cumulative frequency curve for school *A*.

a) 38 mins

b) $46 - 30 = 16$ mins

c) $n = 68 - 8 - 12 - 24 = 24$

$m = 78 - 68 = 10$

d) Mean $= \frac{15\times8+25\times12+35\times24+45\times24+55\times10+65\times2}{8+12+24+24+10+2} = 37.75$

e)

Standard Deviation

$$= \sqrt{\frac{15^2 \times 8 + 25^2 \times 12 + 35^2 \times 24 + 45^2 \times 24 + 55^2 \times 10 + 65^2 \times 2}{8 + 12 + 24 + 24 + 10 + 2} - 37.75^2}$$

$= 12.244 \approx 12.2$

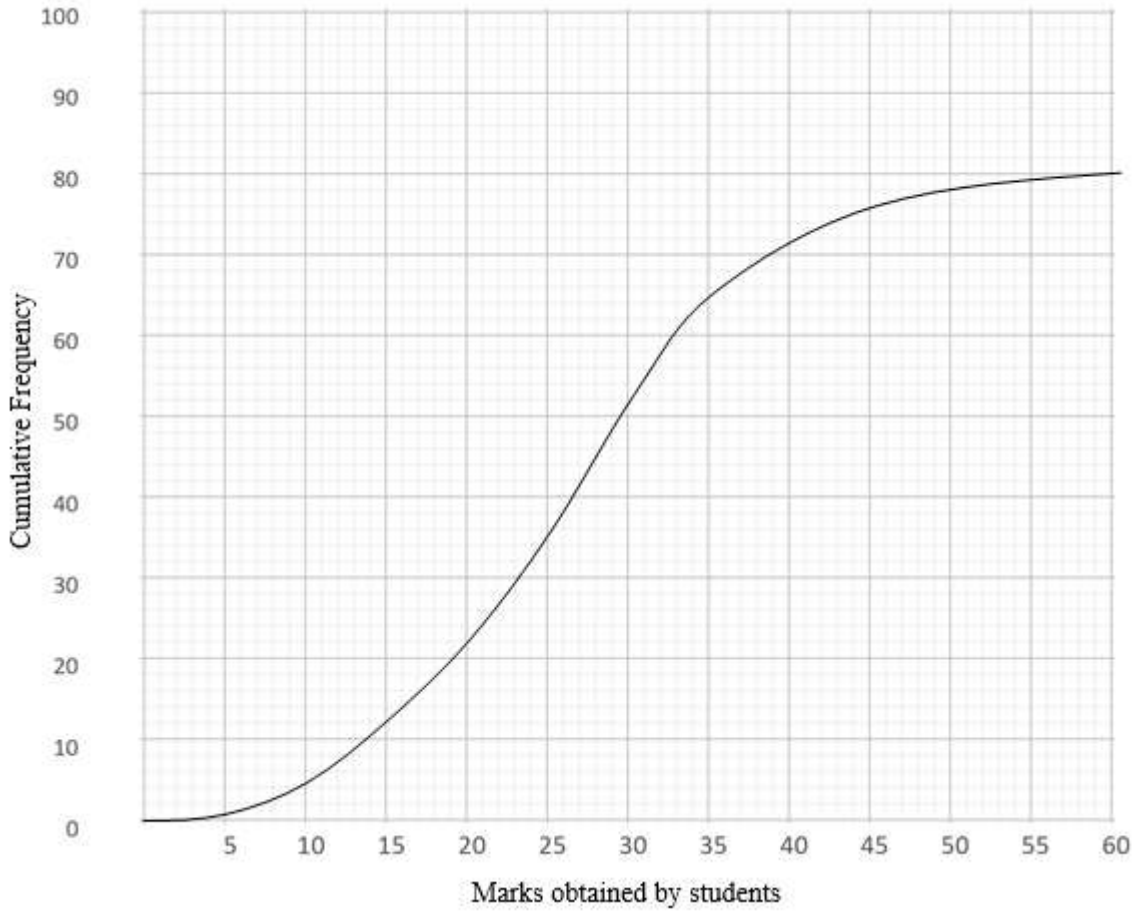
f) $\frac{2}{80} \times 100 = 2.5\%$

g) $\frac{44}{80} \times \frac{43}{79} = \frac{473}{1580}$

h) The steepness of the graph will remain the same but the graph will be to the right of school A graph because of a higher median.

Question 6:

The marks of 80 students for the English test were recorded. The cumulative frequency curve below shows the distribution of the marks.



a) Complete the frequency table below.

Marks obtained by students, x	Number of students
$0 \le x \le 15$	12
$15 < x \le 30$	40
$30 < x \le 45$	24
$45 < x \le 60$	4

b) State the median score

c) Calculate the interquartile range

d) Calculate the passing mark if 60% of the students failed the test.

e) 5% of the class were awarded distinction. Calculate the minimum mark a student should get in order to score distinction

f) The same group of students took the mother tongue test. The median and interquartile range of the mother tongue test were 28 and 25 respectively.

Comment on the performance of the students in the two tests in two different ways.

b) 26.5

c) $33 - 19 = 14$

d) 66

e) 45

f) On average the student has a lower score in their English test than their Mother Tongue test because the median is lower.

The score among students in the English test is more consistent than the score among students in the Mother Tongue test because the interquartile range is lower.

Elementary Math Topical (Statistics)

Question 7:

The table shows the number of books borrowed by the students.

Number of books borrowed	0	1	2	3	4	5
Number of students	7	x	6	2	4	5

a) Given the mean number of books borrowed by the students is 2.25, form an equation in x and use it to find the value of x.

b) Given that the median number of books borrowed by the students is 2, find the largest possible value of x.

c) Calculate the standard deviation of the number of books borrowed when $x = 6$.

d) It was reported that there was an error on all the records in the library system. The new mean calculated based on the correct records is increased by 2 and the standard deviation is unchanged. Explain clearly what error in the records could be.

a)

$$\frac{0\times 7+1\times x+2\times 6+3\times 2+4\times 4+5\times 5}{7+x+6+2+4+5}=2.25$$

$$x+12+6+16+25=54+2.25x$$

$$5=1.25x$$

$$x=4$$

b) Largest possible $x = 9$

c)

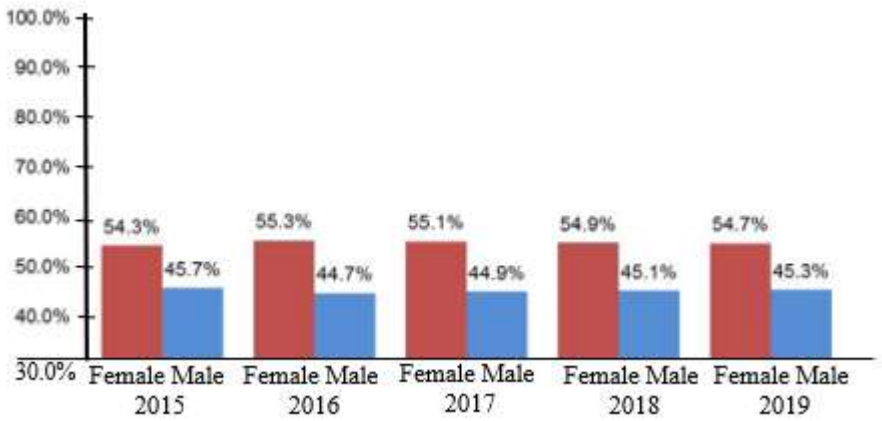
Standard Deviation

$$=\sqrt{\frac{0^2\times 7+1^2\times 6+2^2\times 6+3^2\times 2+4^2\times 4+5^2\times 5}{7+4+6+2+4+5}-\left(\frac{0\times 7+1\times 6+2\times 6+3\times 2+4\times 5+5\times 5}{7+6+6+2+4+5}\right)^2}$$

$$=1.82101\approx 1.82$$

Question 8:

James needed to find out whether there has been an increase or decrease in percentage of male and female population in Singapore from 2015 to 2019. He managed to retrieve a chart shown in the diagram



a) State a reason why this chart is not going to be helpful for him. Suggest what change in the vertical axis can be added to help James with his task.

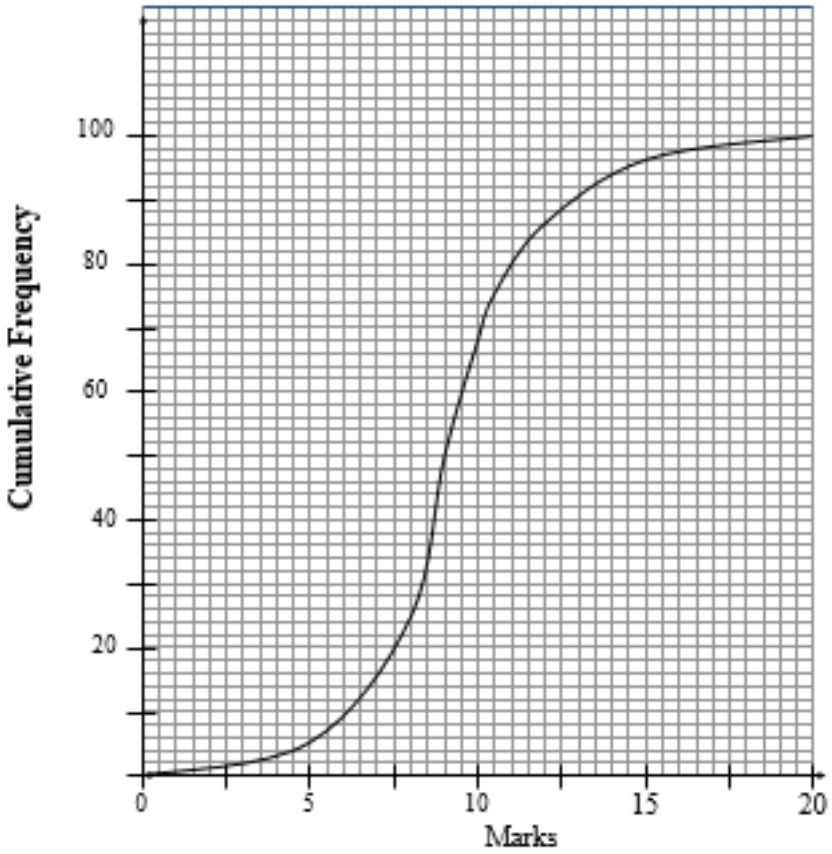
b) State one aspect of the chart that may be misleading and explain how it might lead to a mis-interpretation of the data.

a) It does not show the exact population in each year. The vertical axis should instead be the number of people.

b) The vertical axis did not start from 0. People may read from the length of the bar and assume that the population of male and female has a wide difference.

Question 9:

A group of 100 students took a Mathematics Test. The cumulative frequency curve below shows the distribution of the marks.



Use the curve to estimate

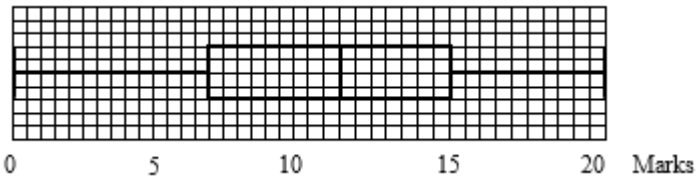
a) the median mark

b) the interquartile range

The passing mark for the test was 15.

c) Two students are chosen randomly from the group of students. Calculate the probability that both students passed the test.

d) The same group of students took a Science Test. The box-and-whisker plot shows the distribution of their marks. Make two comparisons between the performances of the students in the two tests.



a) 9

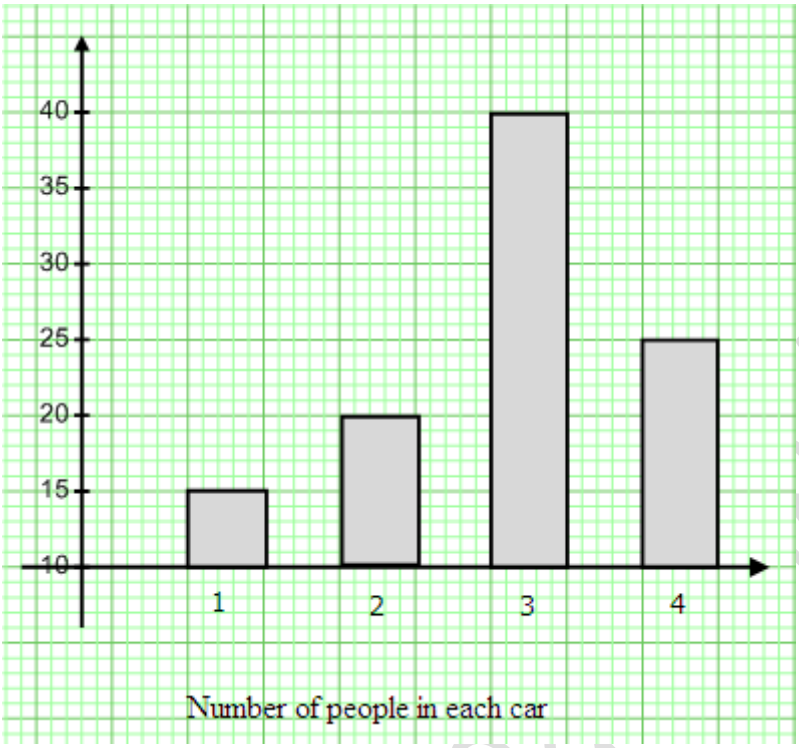
b) $10.5 - 8 = 2.5$

c) $\frac{4}{100} \times \frac{3}{99} = \frac{1}{825}$

d) On average the marks for Science is more than Math as the median is higher. The mark among students for Science is less consistent than Math because the interquartile range is higher.

Question 10:

During a traffic survey, the number of people in each car passing through a particular checkpoint was noted. The results of the survey are shown in the bar chart below.



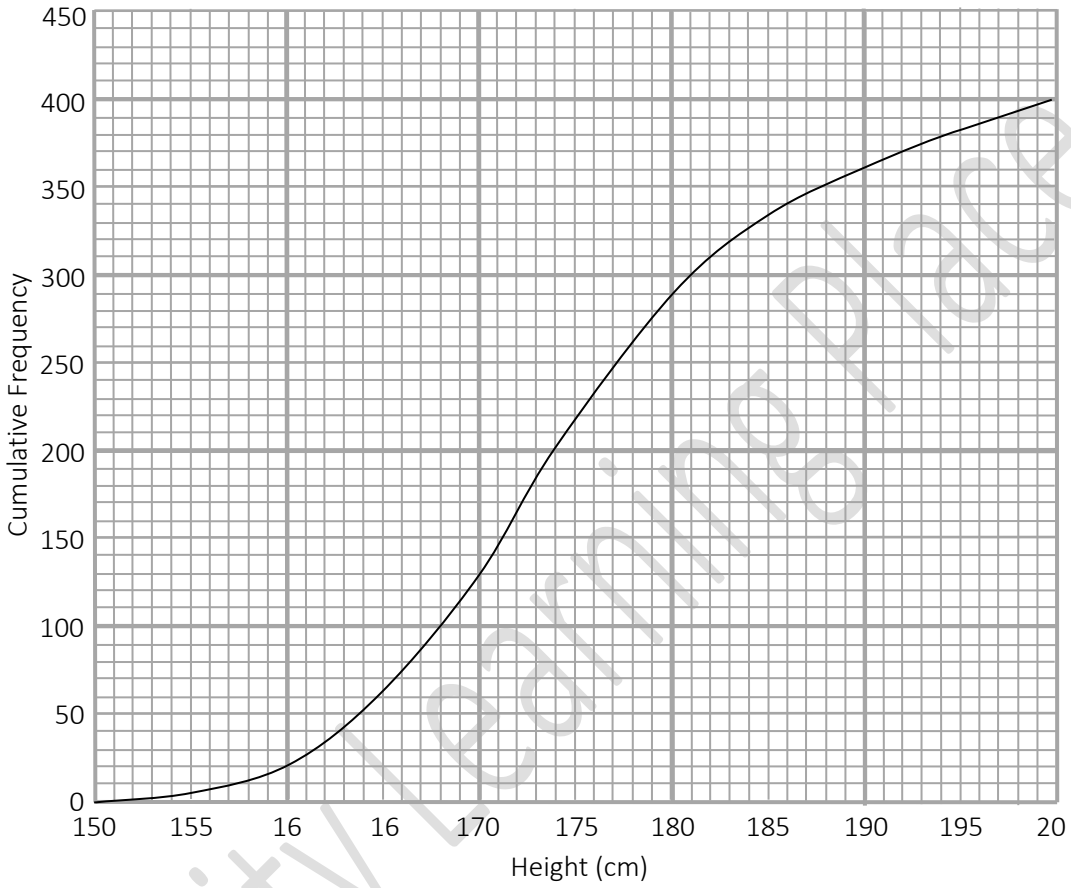
Explain why this bar chart might be considered misleading.

The vertical axis did not start from 0. We may assume that the number of car with 3 people is thrice the number of car with 2 people based on the length of the bar.

Question 11:

The height of 400 boys were taken in a health check campaign.

The cumulative frequency curve shows the distribution of their heights.



a) Complete the grouped frequency table for the 400 boys.

Height (x cm)	$150 < x \leq 160$	$160 < x \leq 170$	$170 < x \leq 180$	$180 < x \leq 190$	$190 < x \leq 200$
No. of boys	20	110	160	70	40

Use the table to estimate

b) the mean height of each boy,

c) the standard deviation of the heights.

d) Explain why the mean and standard deviation are estimates

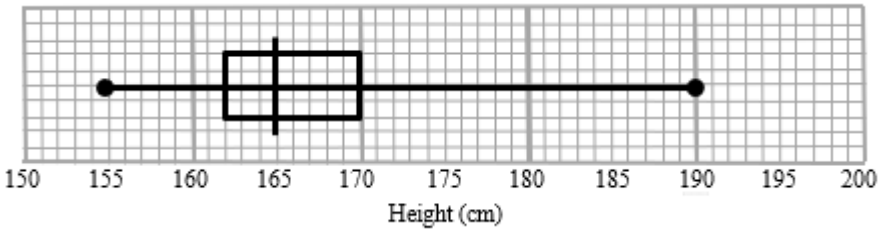
Use the curve to estimate

e) the median height

f) the interquartile range of the heights

The height of 400 girls are taken in another health check campaign.

The box-and-whisker plot shows the distribution of the girls' heights.



g) Make two comments comparing the heights of the boys and the girls.

Find, as a fraction in its simplest form, the probability that

h) a boy, selected at random, was between 160 cm and 170 cm,

i) two girls, selected at random, were taller than 170 cm.

b) 175

c) 10.2

d) We are using the median of each class width to as an estimate for each interval.

e) 174

f) 181-168=13

g) On average, the height of the boys is greater than the girls because it has a higher median. The height among the boys are less consistent as compared to the girls because it has a higher interquartile range.

h) $\frac{110}{440} = \frac{11}{44}$

i) $\frac{100}{400} \times \frac{99}{399} = \frac{33}{532}$

Question 12:

The table below shows the distribution of the mass of a number of apples.

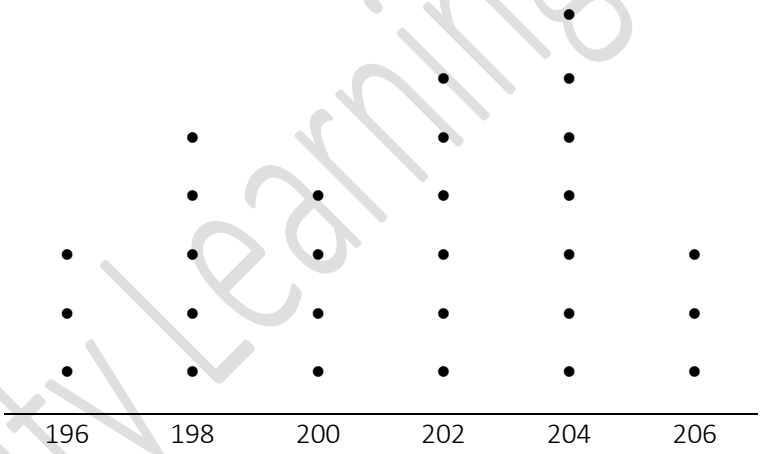
Mass (m) in grams	Frequency
$10 < m \leq 20$	15
$20 < m \leq 30$	20
$30 < m \leq 40$	5

Calculate the standard deviation of the mass of the apples.

6.61

Question 13:

The amount of apple juice dispensed by a machine into a cup is recorded. The results for 28 cups are shown in the dot diagram.



Amount of apple juice dispensed (*ml*)

a) State the modal amount of apple juice dispensed by the machine.

b) Write down the median amount of apple juice dispensed by the machine.

c) Calculate the mean amount of apple juice dispensed by the machine.

a) 204

b) 202

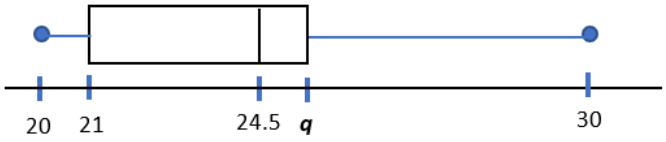
c) 201

Question 14:

The quiz scores of a group of students are arranged in ascending order as follow:

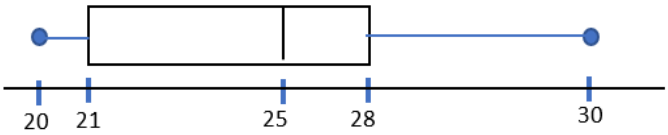
20, 21, 21, 23, ***p***, 25, 25, 25, 28, ***r***

The information is presented in a box and whisker plot diagram below.



a) Find the values of ***p, q*** and ***r***.

b) A new student joined the group. The box and whisker plot diagram is now adjusted as shown below. What is the greatest possible quiz score of the new student?



a) $p = 24$

$q = 25$

$r = 30$

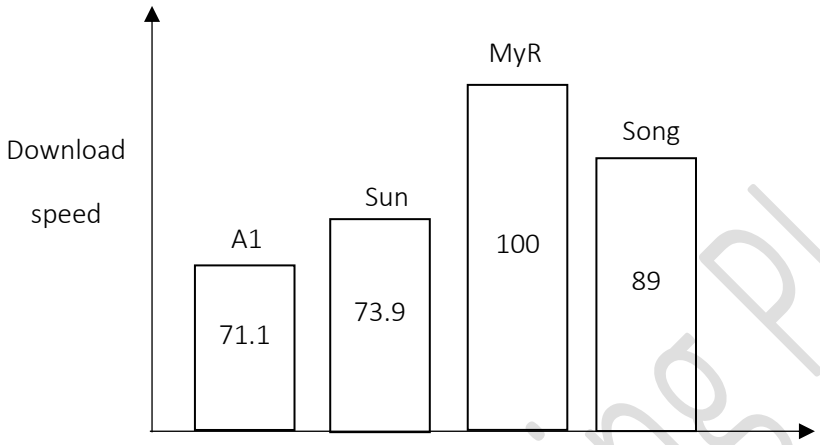
b) 29

Elementary Math Topical (Statistics)

Question 15:

The diagram shows an advertisement of the download speed of four telcos.

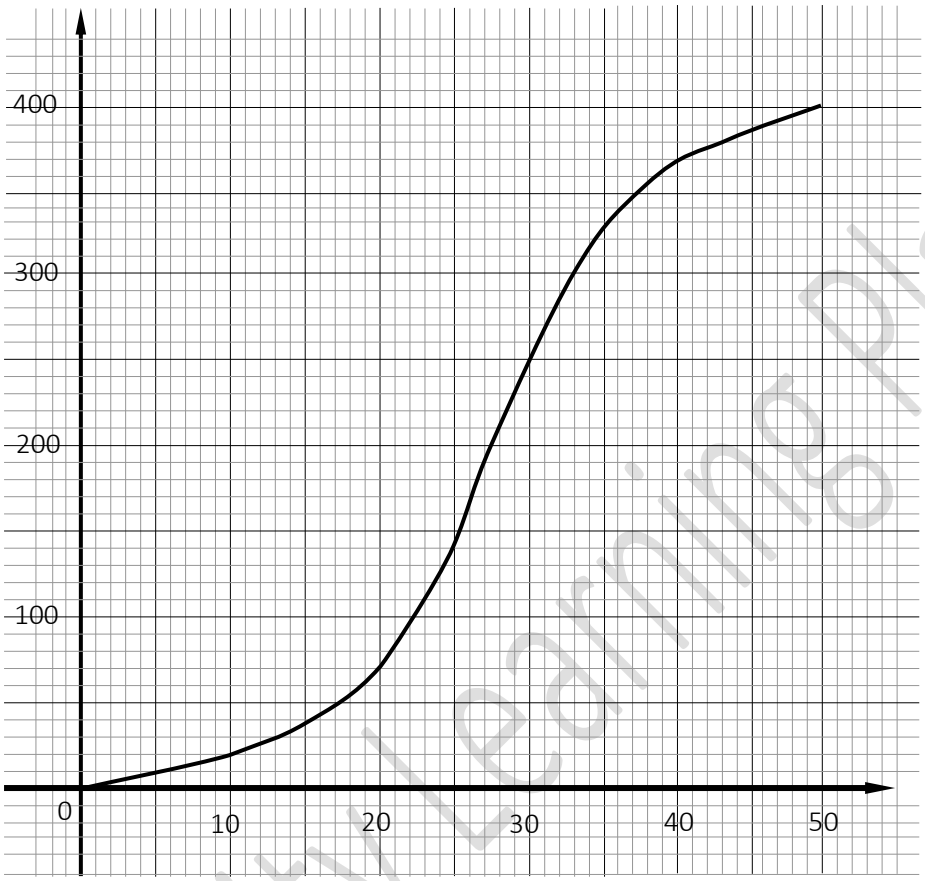
State one aspect of the graph that may be misleading and explain how this may lead to a misinterpretation of the advertisement.



The length of bar is not proportional to the download speed. It may seem that MyR download speed is much faster than the others based on the length of the bar.

Question 16:

The amounts of donations collected by 400 students in school *A* on flag day are represented by the cumulative frequency curve below.



Using the graph, find

a) the median amount of donation, 27.5

b) the 60th percentile 29.5

c) the number of students who collected more than $40 of donations, 30

d) the interquartile range. 33-22=11

e) Complete the group frequency table shown below.

Donations ($)	Frequency
$0 < x \leq 10$	20
$10 < x \leq 20$	50
$20 < x \leq 30$	180
$30 < x \leq 40$	120
$40 < x \leq 50$	30

Use the group frequency table to calculate an estimate of

f) the mean amount of donation,27.25

g) the standard deviation.9.35

h) The amounts of donations collected by 400 students of another school *B* are summarized below. Compare briefly the amount of donations collected by the students from school *A* and school *B* in two different ways.

Mean amount of donation = $29.20
Standard deviation = $9.25

The student in school B donates more money than school A because the mean is higher.

The donations among students in School B are more consistent than donations among school A because the standard deviation is lower.

Elementary Math Topical (Statistics)

Question 17:

A group of 150 people participated in a challenge. The table below shows the distribution of the times taken to complete the challenge.

t (minutes)	$0 \le t < 20$	$20 \le t < 40$	$40 \le t < 60$	$60 \le t < 80$	$80 \le t < 100$
Frequency	8	32	55	45	10

a) Calculate an estimate of the mean time. 52.3

b) Calculate an estimate of the standard deviation of these times. 19.8

c) Explain why your answers in (a) and (b) are estimates.

We use the median in each interval as an estimate for each interval.

d) The organizer realised the times recorded had an error. Every participant completed the challenge 5 minutes faster. State the effect the correction would have on the mean and standard deviation.

The mean will decrease by 5 minutes but the standard deviation will remain unchanged.

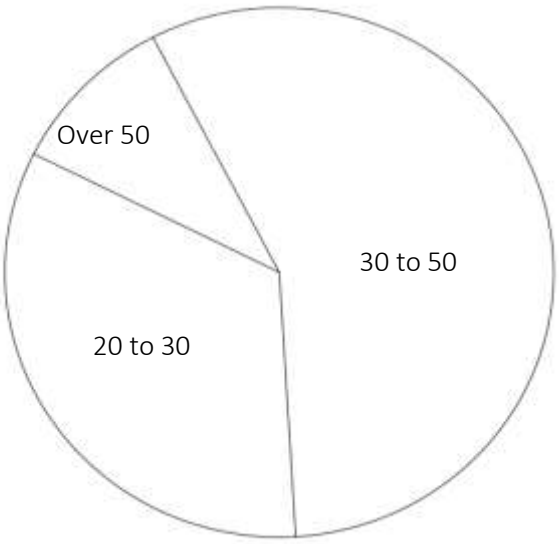
Question 18:

The table below shows the distribution of age groups of workers from Crescent Company.

	20 to 30	30 to 50	Over 50	TOTAL
Females	23	35	7	65
Males	27	50	8	85
TOTAL	50	85	15	150

This **accurate** pie chart shows the age groups of **all the workers.**

a) Find the number of workers who are aged over 50.



b) By completing the table above or otherwise, determine in which group (males or females) a greater percentage of workers are aged 30 to 50 as compared to 20 to 30 and by how much.

Percentage female between 30 to 50 = $\frac{23}{65} \times 100\% = 35.4\%$

Percentage female between 20 to 30 = $\frac{35}{65} \times 100\% = 53.8\%$

Percentage male between 30 to 50 = $\frac{27}{85} \times 100\% = 31.8\%$

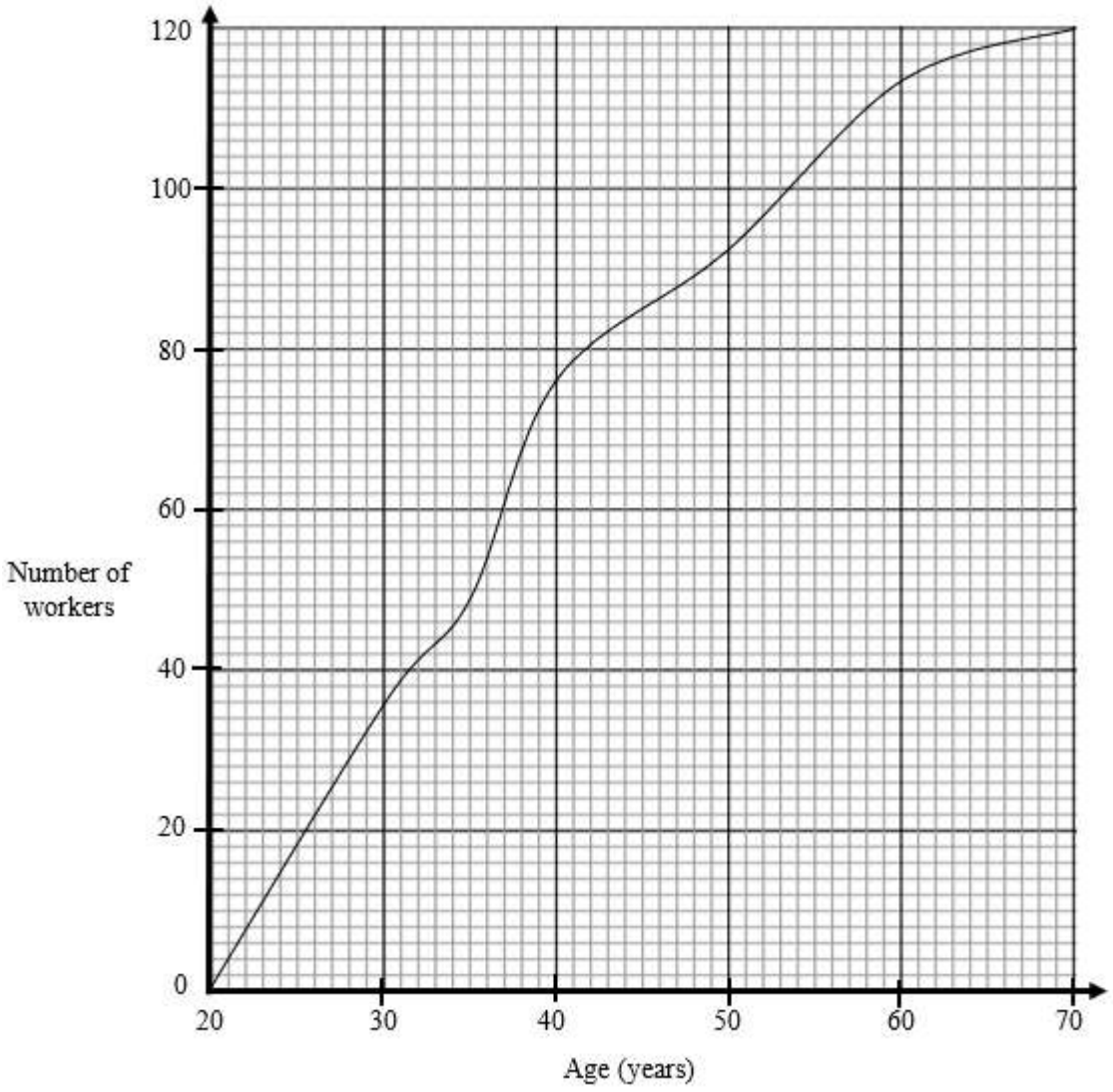
Percentage male between 20 to 30 = $\frac{50}{85} \times 100\% = 58.8\%$

Male has a greater percentage by 27.1%

Elementary Math Topical (Statistics)

Question 19:

The cumulative frequency curve shows the distribution of the ages of 120 workers in company Sunview.



Find, for the workers in Sunview, the

a) median age 37

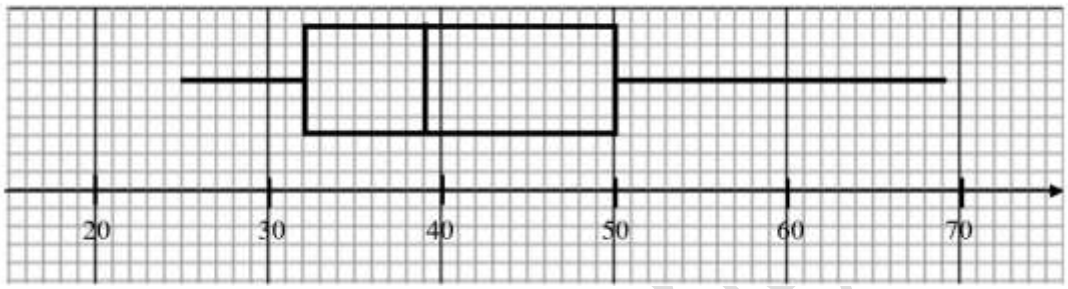
b) interquartile range of the ages 48.5 – 28.5 = 20

c) twentieth percentile 26.5

A group of 120 workers from Riverdew has the same median age but a larger standard deviation from those workers in Sunview. Describe how the cumulative frequency curve will differ from the given curve.

The graph will be steeper but still pass through the point (60 , 37).

d) The box-and-whisker plot below shows the distribution of the ages of another 120 workers in company Sunray.



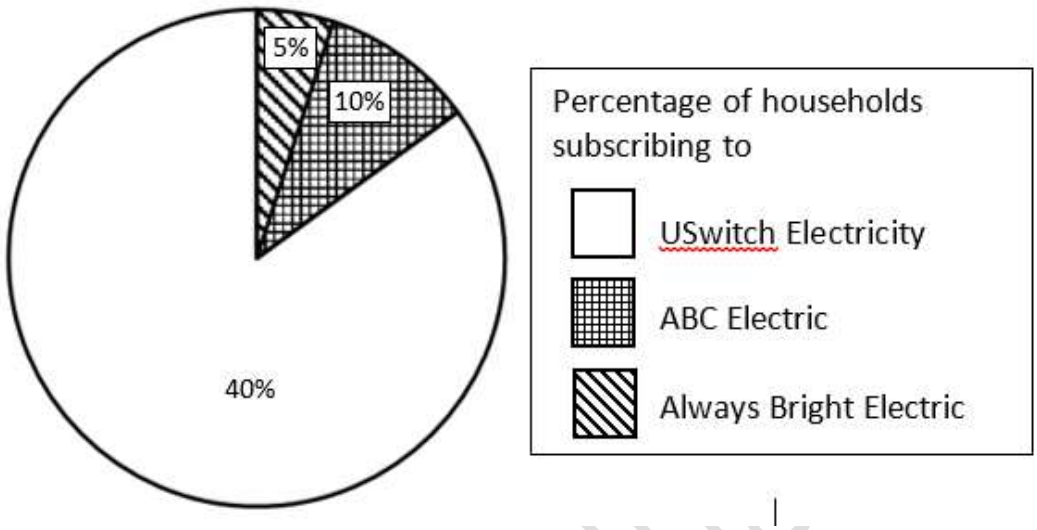
Compare and comment about the spread of the youngest 25% and the oldest 25% of the workers in Sunray, supporting your answer with numerical justification.

The spread of age of the youngest 25% for the 1st group is from 20 to 28.5 whereas the 2nd group is from 25 to 32. This mean the 2nd group has a lesser age spread for the youngerst 25%.

The spread of age of the oldest 25% for the 1st group is from 48.5 to 70 whereas the 2nd group is from 50 to 69. This mean the 2nd group has a lesser age spread for the oldest 25%.

Question 20:

Brandon draws this pie chart to show the electricity companies the households in his block subscribed to.



State one aspect of the pie chart that may be misleading and explain how this may lead to a misinterpretation of the graph.

The area of the sector is not proportional to the percentage. People will assume that more than 50% uses Uswitch Electricity .

Elementary Math Topical (Statistics)

Question 21:

The table shows what some students chose to do after leaving school.

	Employment	Polytechnic	College	Total
Males	51	28	33	112
Females	39	25	20	84
Total	90	53	53	196

a) How many **females** chose to go to college? 20

b) A pie chart is to be drawn showing the data for the **males**.

Calculate the angle representing the males choosing Polytechnic.

$$\frac{25}{196} \times 360 = 45.9°$$

Question 22:

The heights of a group of 14 students were measured.

The results are shown in the stem-and-leaf diagram.

15	6				
16	0	2	4	7	8
17	1	2	2	4	8
18	1	3			
19	0				

Key 16 | 2 means 162 cm

a) Find the median height. 171.5

b) Find the standard deviation of the heights. 9.12

c) It was discovered that the heights had been measured incorrectly. The correct heights were all 5 cm less than those recorded. Explain how the median and standard deviation of the heights have been affected by this error.

The median will decrease by 5 cm but the standard deviation will remain unchange.

Question 23:

The stem-and-leaf diagram shows the masses, in grams, of some oranges.

	19	0	4	4	7			
	20	0	*x*	4	5	6	*y*	
	21	1	2	2	5	7	9	9
	22	3	4	5				
Key:	19	4	represents 194 grams					

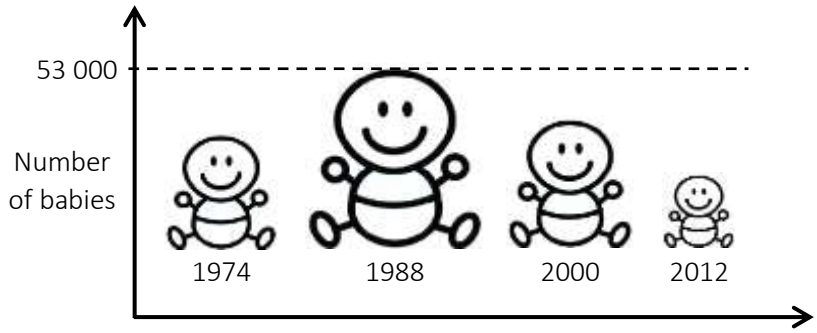
a) For these masses, the interquartile range is 17 grams and the median is 210 grams.

Find the values of *x* and *y*.

$x = 2, \quad y = 9$

Question 24:

The graph shows the number of babies born in Singapore over a number of years.



State one aspect of the graph that may be misleading and explain how this may lead to a misinterpretation of the graph.

The use of 2D figure to represent each year. Reader may use the size of each figure to interpret the babies born over the year instead of just the height.

Elementary Math Topical (Statistics)

Question 25:

The results obtained by a group of students in the Mathematics test and Science test were recorded. The results are shown in the stem-and-leaf diagram.

Mathematics Test						Science Test					
			6	4	1	9					
		9	8	6	2	6	9	9	9		
8	6	4	2	0	3	1	4	6	7	8	9
		9	8	5	4	4	5	6	9		
			0	0	5						
Key (Mathematics Test)						Key (Science Test)					
6|2 means 26 marks						2|6 means 26 marks					

a) Write down the median of the Mathematics test. 34

b) Find the interquartile range for Science test. 44-29=15

c) Make two comments comparing the marks of the Mathematics test and Science test.

On average, the students score higher for the Science test than the Math test because the median score is higher.

The score among student for the Science test is more consistent than score among the Math test because the interquartile range is lower.

Question 26:

The table below shows the number of hours spent on doing revision by some students.

Number of hours	0	1	2	3	4
Number of students	4	12	8	7	x

a) Write down an inequality that must be satisfied by x if the mode is 1. $0 \leq x \leq 11$

b) State the largest possible value of x if the median is 2. 16

c) If the mean number of hours per student is 3, find the value of x.

$$\frac{12 + 16 + 21 + 4x}{31 + x} = 3$$

$$4x + 49 = 93 + 3x$$

$$x = 44$$

Question 27:

The time taken by a group of students from Class 1A to complete a race is shown in the table below.

Time taken (x minutes)	$9 \le x < 10$	$10 \le x < 11$	$11 \le x < 12$	$12 \le x < 13$	$13 \le x < 14$
Frequency	14	16	9	6	5

Calculate an estimate of

a) the mean time, 10.9

b) the standard deviation. 1.28

The time taken by a group of students from Class 1B to complete the same race is summarised below.

Mean time taken	11.5 minutes
Standard deviation	1.0 minutes

c) Make two comparisons between the time taken to complete the race by the two groups of students.

d) It was found that the timing for one student from Class 1B was not recorded.

The student took 9 minutes to complete the race. State the impact the new data has on the mean time and the standard deviation of Class 1B.

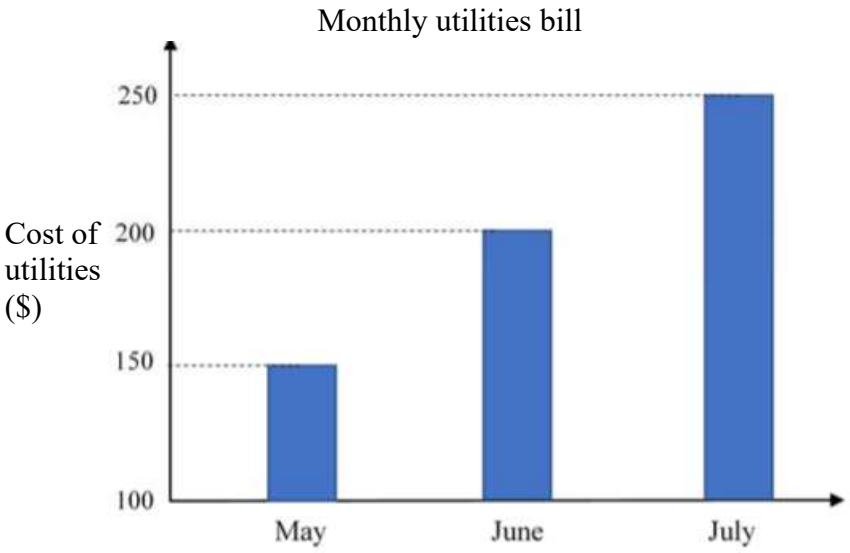
c) On average, Class 1B complete the race slower than Class 1A because the mean time is higher.

The timing among students in Class 1B is more consistent than timing among students in Class 1A because the standard deviation is lower.

d) The standard deviation will increase but the mean will decrease.

Question 28:

Sally draws the graph below to represent her utilities bill for each of the last three months.



State one aspect of the graph that may be misleading and how this may lead to a misinterpretation of the graph.

The vertical axis did not start from 0. It appears that the utilities bill in July is 3 times more than that of May which is not the case

Question 29:

The frequency table shows the weight of 400 people who signed up for a weight loss program.

Weight, x kg	$55 \leq x < 65$	$65 \leq x < 75$	$75 \leq x < 85$	$85 \leq x < 95$	$95 \leq x < 105$
Number of participants	15	85	105	130	65

Estimate

a) the mean weight 83.625

b) the standard deviation

One participant was selected at random.

Find, as a fraction in its lowest term, the probability that the participant selected was

c) less than 65 kg,

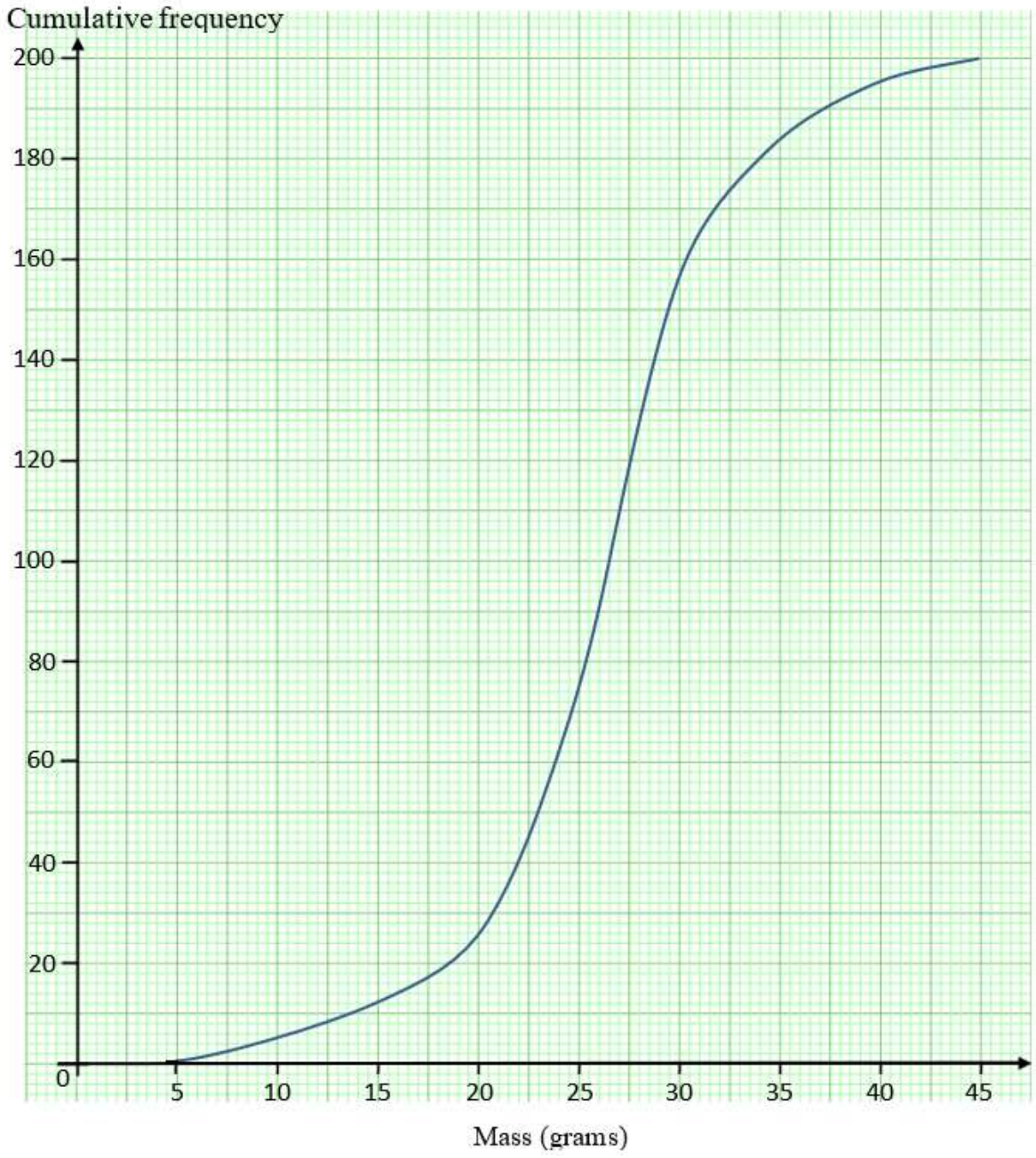
$\frac{15}{400} = \frac{3}{80}$

d) at least 85 kg.

$\frac{195}{400} = \frac{39}{80}$

Question 30:

Farmer John harvested 20 apples from his orchid. The cumulative frequency curve below shows the distribution of the masses of the apples.



Use the curve to estimate

a) the median mass of the apples 23

b) the interquartile range 29.5 – 23=6.5

c) $84\frac{1}{2}$ % of the apples are more than *x* grams. Find the value of *x* 21.5

All the apples are sorted to its size. 60 apples are classified to be 'Large' apples and sold at $1.60 each. The remaining apples are classified to be 'Small' apples and sold at 50 cents each. Find, as a fraction in its simplest form, the probability that

d) exactly $3.20 is collected from the sale of 2 apples, $\frac{60}{200} \times \frac{59}{199} = \frac{177}{1990}$

e) exactly $2.10 is collected from the sale of 2 apples. $\frac{84}{199}$

f) If 5 apples were sold, calculate the probability that the money collected will be more than $2.50.

0.836

Question 31:

The pictogram shows the number of students who travel to school either by bus or by car.

Mode of Transport of Students

Bus	
Car	

a) Mary claims that the number of students who travelled to school by bus and by car are the same. Do you support Mary's claim on the pictogram?

b) Suggest one way to improve the pictogram to avoid misinterpretation of the data.

a) Yes.

b) Use the same object to represent each category.

Question 32:

The number of social networking accounts of 100 students is recorded.

Number of social networking accounts	1	2	3	4	5
Number of students	23	*x*	19	*y*	9

a) Show that $x+y=49$.

b) The mean number of social networking accounts is 2.49.

Show that $x+2y=62$.

c) Hence, find the value of *x* and *y*.

a)

$$23+x+19+y+9=100$$

$$x+y=49$$

b)

$$\frac{23+2x+57+4y+45}{100}=2.49$$

$$125+2x+4y=249$$

$$2x+4y=124$$

$$x+2y=62$$

c)

$$y=13$$

$$x=36$$

Question 33:

The height, in centimetres, of 15 boys and 20 girls were recorded.

The data are shown in the stem-and-leaf diagram.

Boys		Girls
7	13	1 2 4 6
5 3 1	14	0 2 3 5
9 6 4	15	2 4 *p* 8 9
7 5 3 1	16	1 2 2 5 6
q 7 4 2	17	3 7

Key (Boys)
7|13 means 137 cm

Key (Girls)
13|1 means 131 cm

a) The median height for the girls is 155 cm. Find p. 6

b) The range of the heights for the boys is 42 cm. Find q. 9

c) The data for the girl's height 177 was recorded wrongly. The correct data should be 179. Will there be changes to the median and mean due to this error? If yes, state the changes clearly.

The median will remain unchange but the mean will increase.

Elementary Math Topical (Statistics)

Question 34:

The stem-and-leaf diagram shows the test marks of sixteen boys and fifteen girls in a Science test.

Boys		Girls
9 9 5 2 0	5	2 2 3 6 9 9
8 7 5 4 1 1	6	0 2 4 4
9 6 3	7	1 3 3 3
0 0	8	0
Key : 0|5 means 50 marks		Key : 5|2 means 52 marks

From these test marks, find

a) the modal mark for girls 73

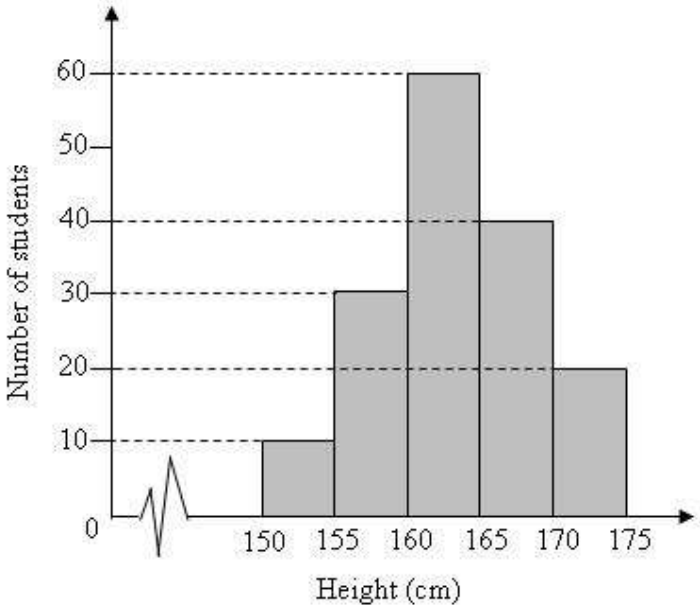
b) the median marks for boys. 64.5

c) Explain briefly whether the boys or girls performed better in the test.

The boys performed better because the median is higher.

Question 35:

The histogram shows the height distribution of a group of 160 students from school ***X***.



a) Complete the frequency table to represent the above data.

Height (cm)	Frequency
$150 < h \leq 155$	10
$155 < h \leq 160$	30
$160 < h \leq 165$	60
$165 < h \leq 170$	40
$170 < h \leq 175$	20

b) Calculate an estimate of the mean height. 163.4375

c) Calculate an estimate of the standard deviation of the height. 5.37

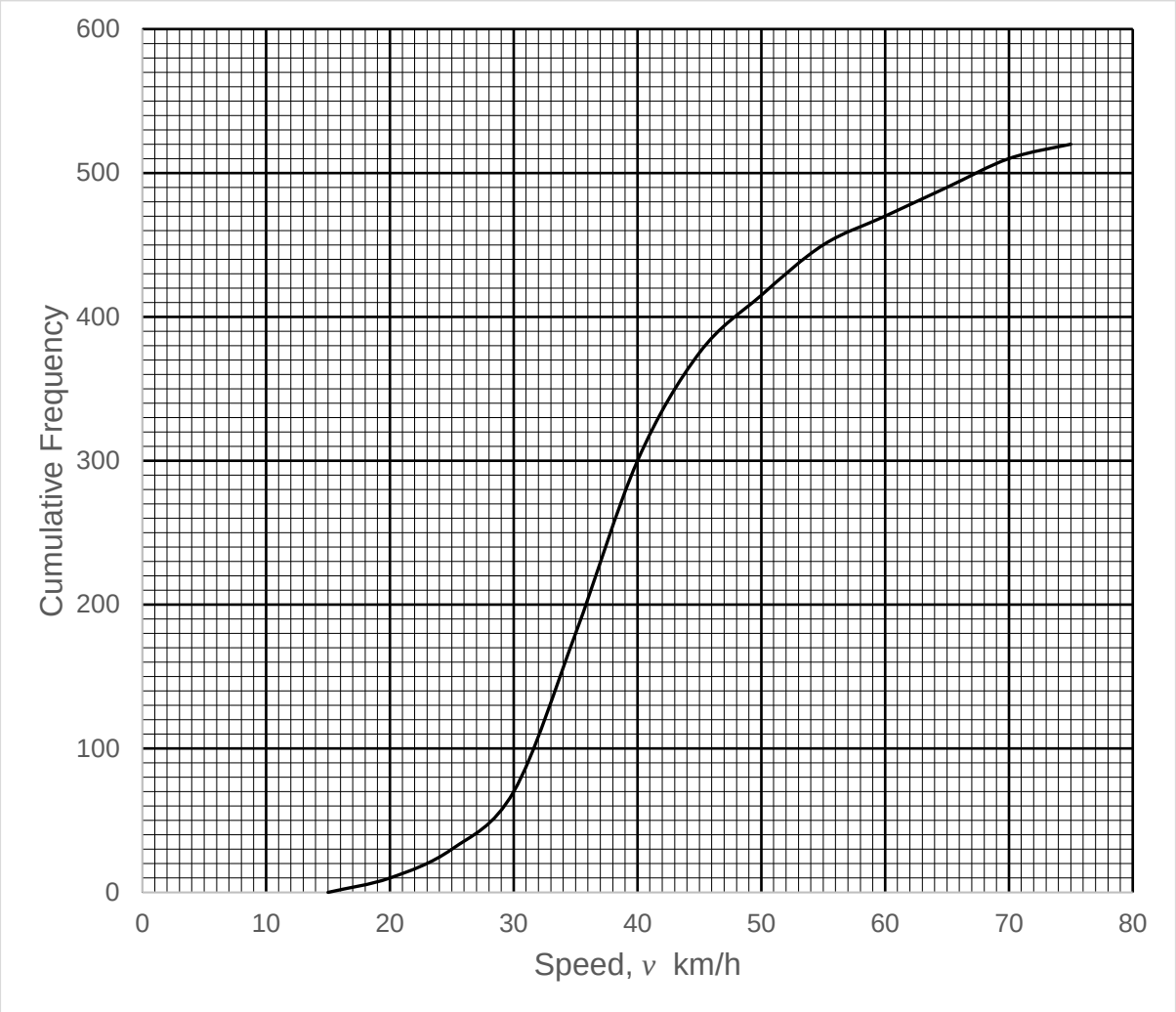
d) Another group of 160 students from School ***Y*** has mean height of 164.5 cm and standard deviation of 4.95 cm. Make **two** comments comparing the height of the students from the two schools.

On average the height of student in School Y is taller than student in School X because the mean height is higher.

The height among students in School Y is more consistent than height of students in School X because it has a lower standard deviation.

Question 36:

An observer notes the speeds of 520 cars as they pass a certain point. The cumulative frequency curve below shows the speed, *v* km/h, and the number of cars whose speed is less than or equal to *v* km/h.



Showing your method clearly, use the curve to estimate the

a) number of cars whose speed is less than or equal to 30 km /h, 70

b) median speed 38

c) interquartile range 46.5 – 33 = 13.5

d) percentage of cars that exceeded the speed limit, given that the speed limit is 50 km/h.

$$\frac{105}{520} \times 100\% = 20.2\%$$

e) Complete the following frequency table.

Speed, v km/h	$15 \leq v < 25$	$25 \leq v < 35$	$35 \leq v < 45$	$45 \leq v < 55$	$55 \leq v < 65$	$65 \leq v < 75$
No. of cars	30	150	195	75	40	30

f) Showing your method clearly, calculate an estimate of the mean speed of the 520 cars.

Mean $= \frac{20\times30+30\times150+40\times195+50\times75+60\times40+70\times30}{30+150+195+75+40+30} = 40.7$