

Q1. Consider the set of temperatures of random days in June,

Temperatures	15	22	21	26	15	18
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- (a) Work out the mean
- (b) Work out the mode
- (c) Work out the median
- (d) Work out the range
- (e) Comment on the limitation of this data and what you could do to make it better

a)
$$\frac{15 + 22 + 21 + 26 + 15 + 18}{6} = 19.5$$

b) 15

c) Order the number's: 15 15 18 21 22 26
$$\frac{18 + 21}{2} = 19.5$$

d) largest: 26 Smallest: 15

s- Range: $26 - 15 = 11$

e) Smallest sample size.

Q2.

I have a set of data and use the formula $f(x) = 2x + 3$ to get a new set of data.

- (a) How does the mean change?
- (b) How does the mode change?
- (c) How does the median change?
- (d) How does the range change?

$$\begin{aligned} \text{a)} \quad \frac{(2a+3) + (2b+3) + \dots}{n} &= \frac{2(a + \dots) + 3n}{n} \\ &= 2\left(\frac{a + \dots}{n}\right) + 3 \end{aligned}$$

So if the old mean was x the new one is $f(x)$

b) Let x be the old mode then $f(x)$ is the new mode

c) Let x be the old median then the new one is $f(x)$.

d) Let x be the smallest and y the largest then the range is $y - x$

$$\begin{aligned} \text{So the new one is } (2y+3) - (2x+3) \\ = 2y - 2x = 2(y-x) \end{aligned}$$

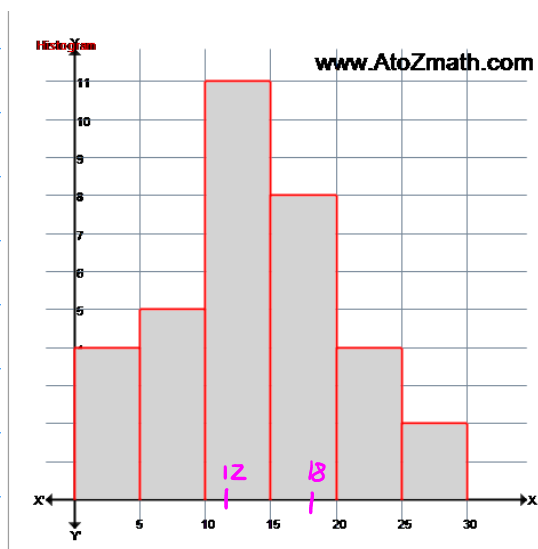
Q3.

We are given a set of data on Sibling ages in a school,

ages	$0 \leq x < 5$	$5 \leq x < 10$	$10 \leq x < 15$	$15 \leq x < 20$	$20 \leq x < 25$	$25 \leq x < 30$
frequency	4	5	11	8	4	2

- Plot a Histogram to represent this data
- Calculate an estimate for the mean using midpoints
- Use your histogram to estimate the number of siblings aged between 12 and 18.
- Calculate an estimate for the median using interpolation.

a)



b) use the midpoint:

$$(2.5 \times 4) + (7.5 \times 5) + (12.5 \times 11) + (17.5 \times 8) + (22.5 \times 4) + (27.5 \times 2)$$

$$40$$

$$= 11.75$$

c) Each block represents 1 person

so we have

$$\frac{(15-12)}{5} \times 11 + \frac{(18-15)}{5} \times 8 = 34.6$$

d) the frequency is 40,

then the middle spot is $\frac{41}{2} = 20.5$.

Now we must use linear interpolation.

$$\text{median} = 20 + 4(20.5 - 20)$$

$$= 20 + \frac{4}{2} = \underline{\underline{22}}$$

Q4.

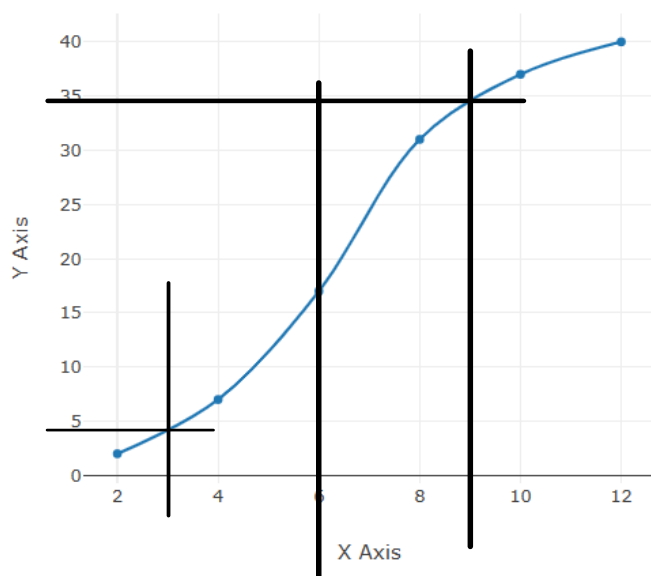
We are given the hours studied for students in a class

Hours studied	$0 \leq x < 2$	$2 \leq x < 4$	$4 \leq x < 6$	$6 \leq x < 8$	$8 \leq x < 10$	$10 \leq x < 12$
Frequency	2	5	10	14	6	3

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- Draw a cumulative frequency graph
- Draw a smooth s-curve
- Use the graph to estimate the interquartile range
- Calculate an estimate for the median
- Use your diagram to estimate the number of students who study for more than over 5.5 hours
- Explain why the mean may not be the best average to use for this data?

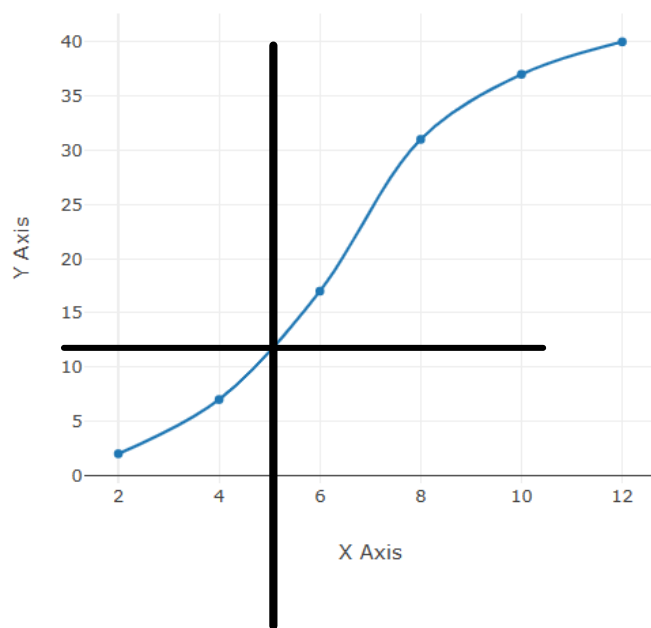
a, b)



$$c) \quad \frac{12}{4} = 3 \quad \text{and} \quad \frac{12 \times 3}{4} = \frac{36}{4} = 9$$

$$\text{So IQR: } 34.5 - 4 = 30.5$$

d) $\frac{12}{2} = 6$ So line draw on above graph at $y=6$. So the median is 17.



12 students work for less than 5.5 hours so $40 - 12 = 28$ work for more.

f) Since it is affected by extreme data. Also the mean is only an estimate since the data is grouped.