

SHARP

Worksheet 9 Memo – Statistics

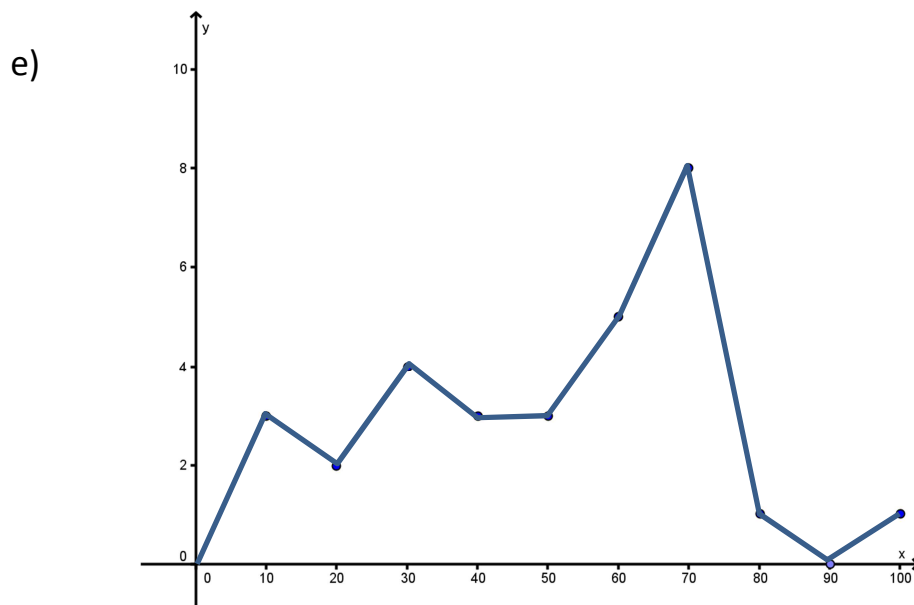
1. a) 54

$$\begin{aligned} \text{b) } \bar{x} &= \frac{\sum x}{n} \\ \therefore \bar{x} &= \frac{1\,339}{30} \\ \therefore \bar{x} &= 44,63 \end{aligned}$$

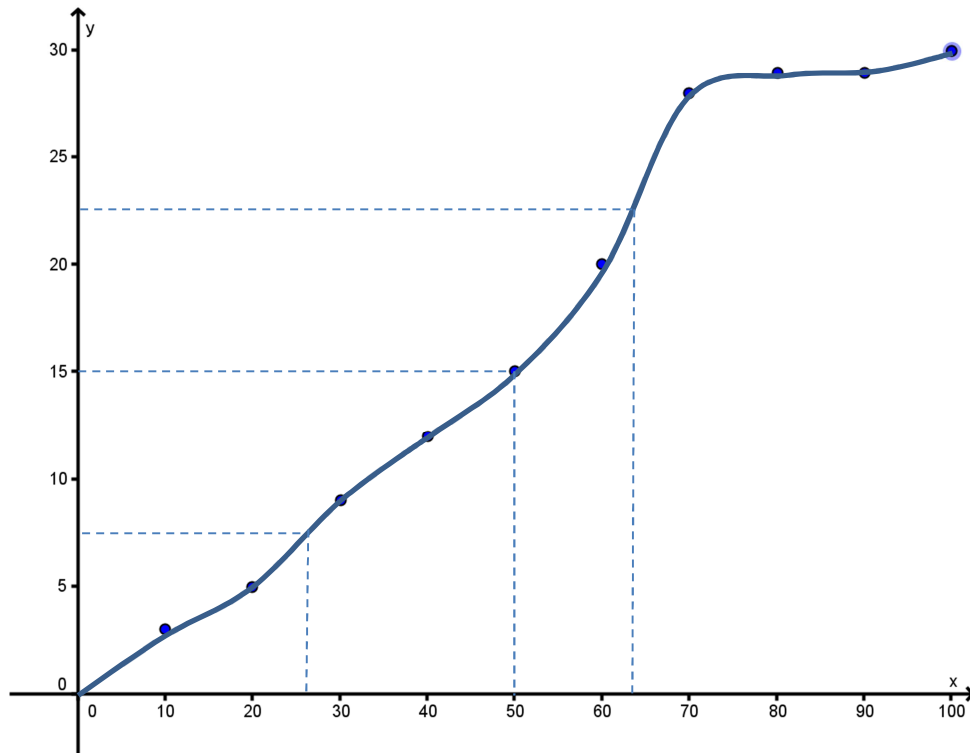
c) $\sigma x = 23,26$

d)

Number of Competitions per month	Frequency	Cumulative Frequency
$0 \leq x < 10$	3	3
$10 \leq x < 20$	2	5
$20 \leq x < 30$	4	9
$30 \leq x < 40$	3	12
$40 \leq x < 50$	3	15
$50 \leq x < 60$	5	20
$60 \leq x < 70$	8	28
$70 \leq x < 80$	1	29
$80 \leq x < 90$	0	29
$90 \leq x < 100$	1	30



f)



g)

Quartile 1 = 26

Median = 50

Quartile 3 = 63

h)

Range = maximum – minimum

$$= 98 - 5$$

$$= 93$$

i)

$$\text{IQR} = Q_3 - Q_1$$

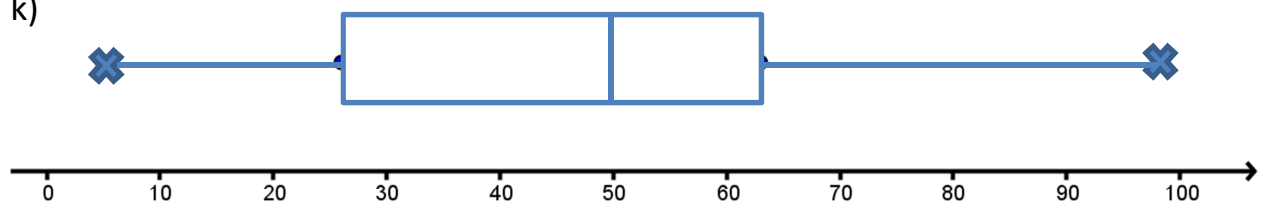
$$= 63 - 26$$

$$= 37$$

j)

The data is skewed to the left because the tail is on the left hand side and the peak is towards the right hand side.

k)



l) one standard deviation from the mean:

$$\begin{aligned}\bar{x} - \sigma &= 44,63 - 23,26 \\ &= 21,37\end{aligned}$$

$$\begin{aligned}\bar{x} + \sigma &= 44,63 + 23,26 \\ &= 67,89\end{aligned}$$

∴ Number of people between these two values = 20

∴ Percentage of people who entered competitions within one standard deviation from the mean = $\frac{20}{30} \times 100 = 67\%$

2. a) $\bar{x} = \frac{\sum x}{n}$
∴ $\bar{x} = \frac{1738}{15}$
∴ $\bar{x} = 115,87 \text{ kg}$

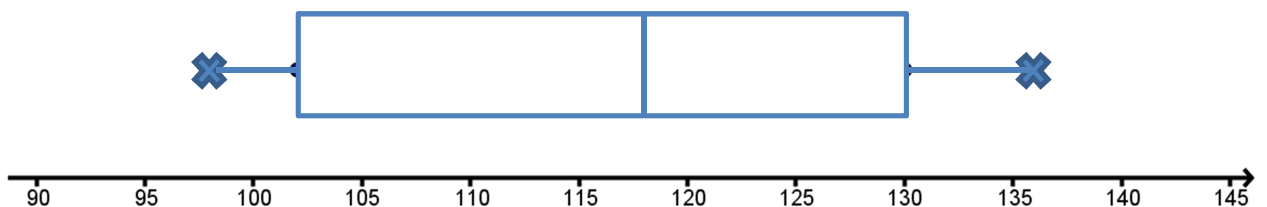
b) $\sigma = 16,73$

c) The second school has a greater average mass with less variation on the field and will perform better when it comes to scrums, however this might be to the first school's advantage as they have more less heavy players who will be able to run faster.

d) Yes there is an outlier, 72. It is more than one standard deviation away from the next lowest value.

e) The new average will be 117,67 which only increases the average mass by 2 kg, and the new standard deviation will be 12,93 which is down by 4kg.

f) Minimum = 98
Quartile 1 = 102
Median = 118
Quartile 3 = 130
Maximum = 136



3. a) $\bar{x} = \frac{\sum x}{n}$
 $\therefore \bar{x} = \frac{131}{20}$
 $\therefore \bar{x} = 6.55$

b) 0 1 2 2 3 4 4 5 6 6 6 7 7 8 9 10 10 12 14 15

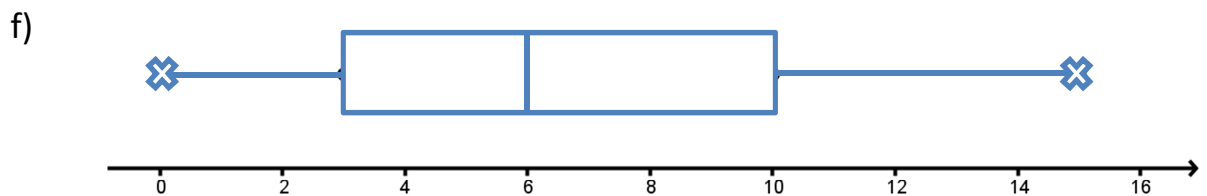
Median = 6

c) mode = 6

d) Quartile 1 = 3
 Quartile 3 = 10

e) range = maximum – minimum
 $= 15 - 0$
 $= 15$

Interquartile range = Quartile 3 – Quartile 1
 $= 10 - 3$
 $= 7$



g) tail to the right so skewed to the right.

h) 50%

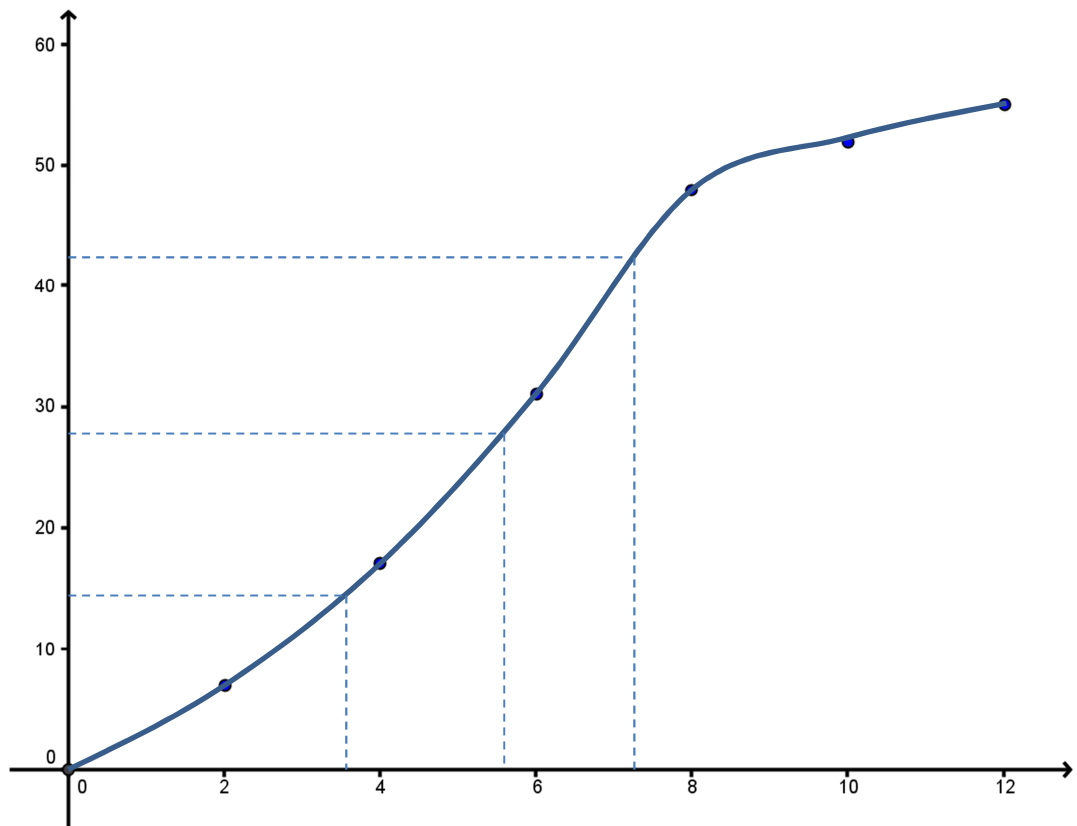
i) 25%

j) 50%

4. a)

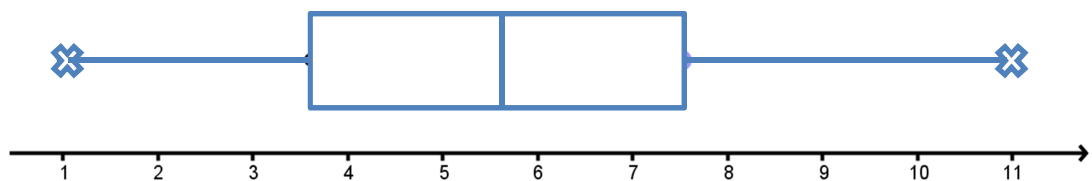
Number of Chocolates Bought	Frequency	Cumulative Frequency
$0 \leq x < 2$	7	7
$2 \leq x < 4$	10	17
$4 \leq x < 6$	14	31
$6 \leq x < 8$	17	48
$8 \leq x < 10$	4	52
$10 \leq x < 12$	3	55

b)



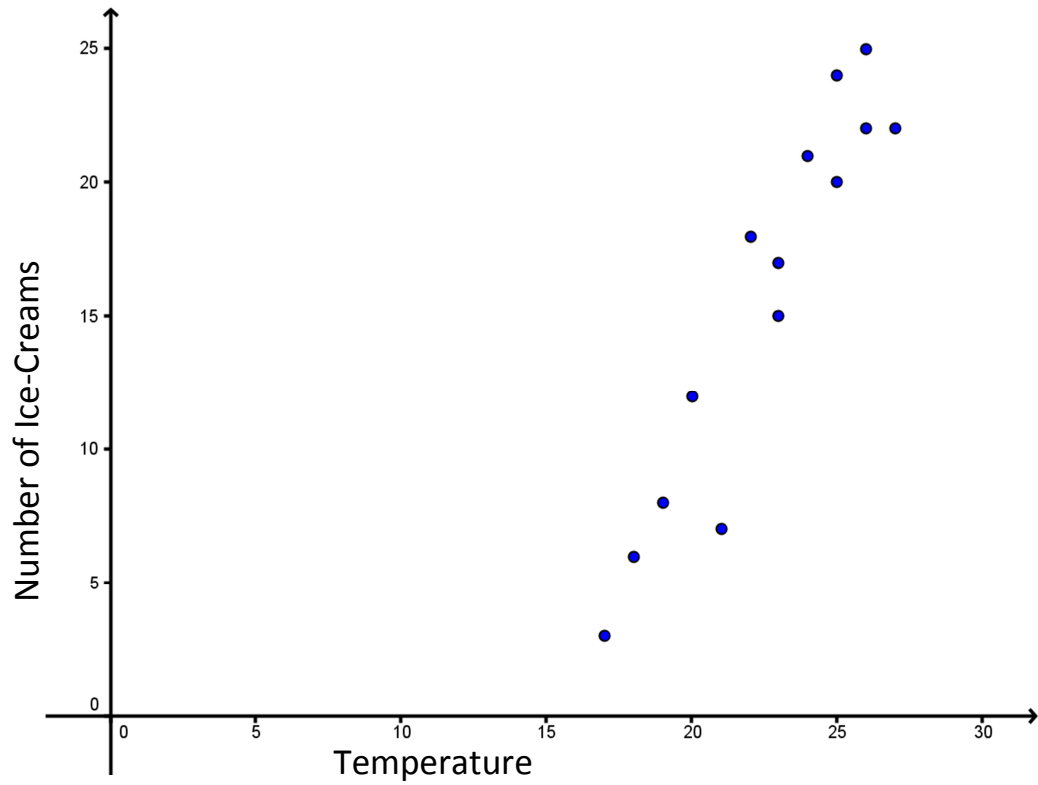
c) Quartile 1 = 3.6
 Median = 5.6
 Quartile 3 = 7.5

d)

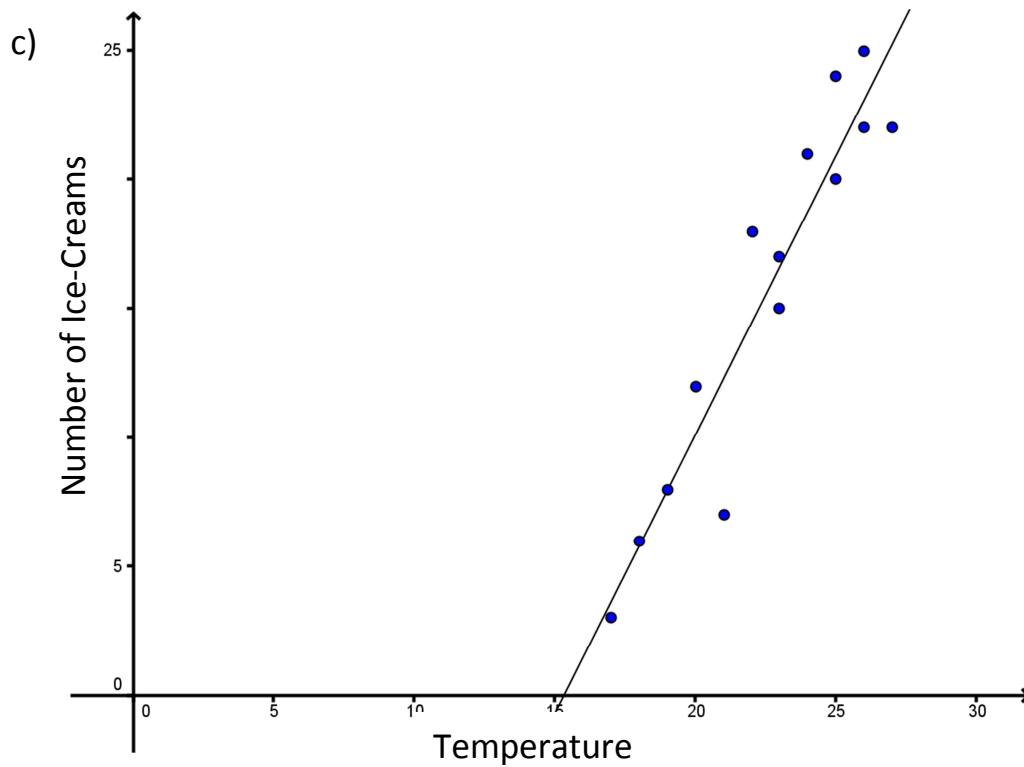


- e) The data is distributed symmetrically.
- f) Interquartile Range = Quartile 3 – Quartile 1
 $= 7.5 - 3.6$
 $= 3.9$

5. a)



b) linear



d) $y = bx + a$

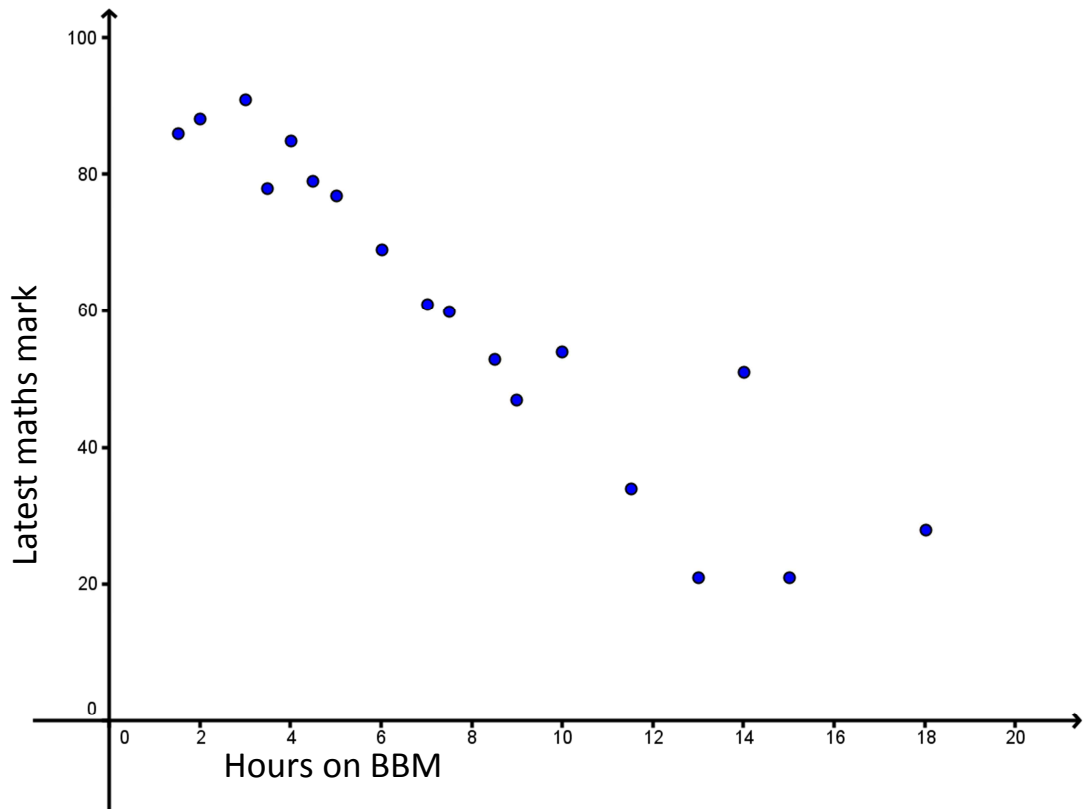
$\therefore b = 2.16$

$\therefore a = -33.11$

$\therefore y = 2.16x - 33.11$

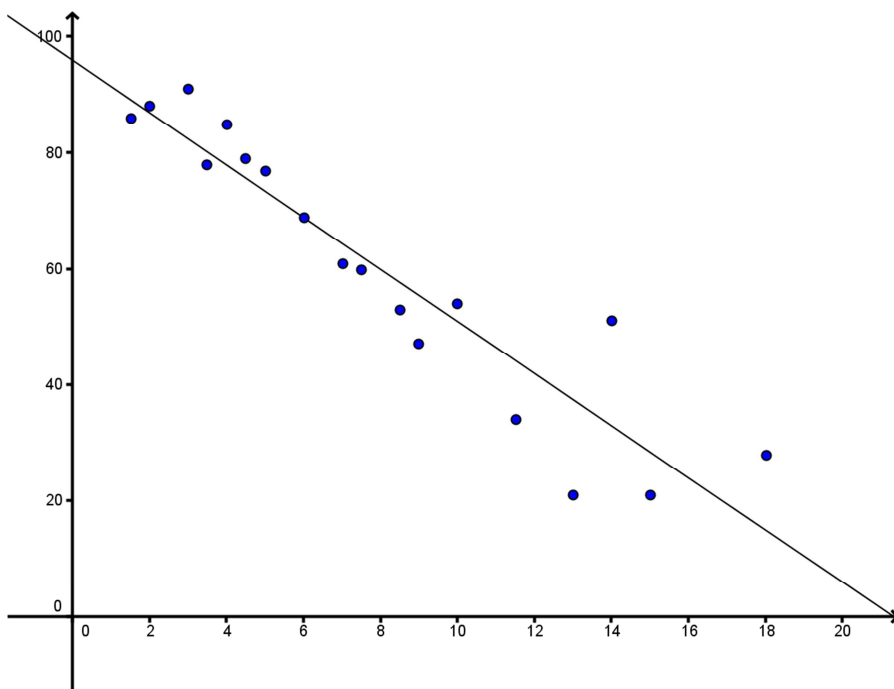
e) positive strong relationship

6. a)



b) Linear

c)



d) 71%

e) 3.5 hours

f) $y = bx + a$

$$\therefore b = -4.5$$

$$\therefore a = 95.92$$

$$\therefore y = -4.5x + 95.92$$

g) negative, moderately strong relationship

h) Yes, (14; 51) and (18, 28)

i) $y = bx + a$

$$\therefore b = -5.64$$

$$\therefore a = 101.87$$

$$\therefore y = -5,64x + 101.87$$