

x data value Σ sum of $\bar{x}$ mean n number of pieces of data f frequency

MEAN

$$\bar{x} = \frac{\Sigma fx}{\Sigma f}$$

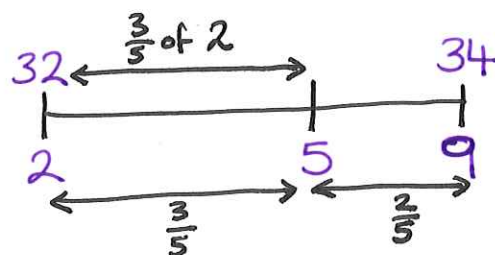
for grouped continuous data
 x = mid point

MEDIAN

Interpolation - estimate the median (what fraction into the interval)

$30 < t \leq 32$	$32 < t \leq 34$	$34 < t \leq 35$
2	7	1

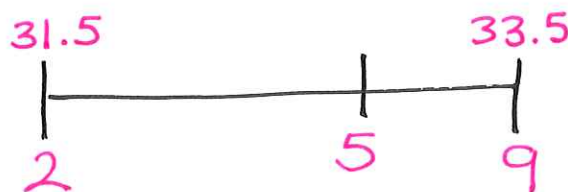
$2 + 7 + 1 = 10$ $10 \div 2 = 5^{\text{th}} \text{ number}$



$$\text{Median} = 2 + \left(\frac{3}{5} \times 2\right)$$

watch out for data that has been rounded

$30 - 31$	$32 - 33$	$34 - 35$
2	7	1



STANDARD DEVIATION

$$\sigma = \sqrt{\frac{\Sigma x^2}{n} - (\bar{x})^2} \quad \text{or} \quad \sqrt{\frac{S_{xx}}{n}}$$

For continuous data x = mid-point

$$SD = \sigma$$

$$\text{variance} = \sigma^2$$

CODING

mean is effected by $\times \div + -$

Standard Deviation is effected by $\times$ and $\div$ only

original

coding

coded data

$$\bar{x}$$

$$\times 3$$

$$\bar{y} = 3\bar{x}$$

$$\bar{x}$$

$$\div 3$$

$$\bar{y} = \frac{\bar{x}}{3}$$

$$\bar{x}$$

$$+ 3$$

$$\bar{y} = \bar{x} + 3$$

$$\bar{x}$$

$$- 3$$

$$\bar{y} = \bar{x} - 3$$

$$\bar{x}$$

$$\times 3 + 3$$

$$\bar{y} = 3\bar{x} + 3$$

$$\sigma_x$$

$$\times 3$$

$$\sigma_y = 3\sigma_x$$

$$\sigma_x$$

$$\div 3$$

$$\sigma_y = \frac{\sigma_x}{3}$$

$$\sigma_x$$

$$+ 3$$

$$\sigma_y = \sigma_x$$

$$\sigma_x$$

$$- 3$$

$$\sigma_y = \sigma_x$$

$$\sigma_x$$

$$\times 3 + 3$$

$$\sigma_y = 3\sigma_x$$