

AVERAGES:

There are three different types of **average**:

MODE
most common

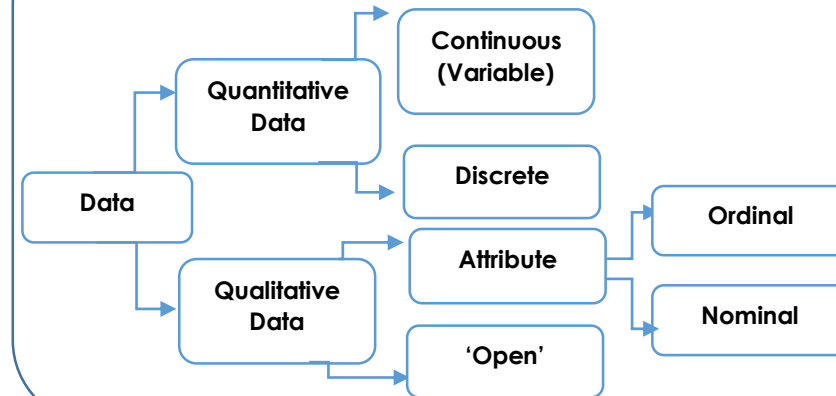
MEAN
 $\frac{\text{sum of values}}{\text{number of values}}$

MEDIAN
middle value

The **range** is not an average, but tells you how the data is spread out:

RANGE
largest value – smallest value

DATA TYPES:



ESTIMATE:

An answer that is close to the exact answer



EVALUATE:

Evaluating expressions... given $z = 10$

$$6 + z$$

$$6 + z = 6 + 10 = 16$$

$$20 - z$$

$$20 - z = 20 - 10 = 10$$

$$5z$$

$$5z = 5 \times 10 = 50$$

PROPORTION:

3 people paint a fence in 4 days:

6 people
2 days

12 people
1 day

2 people
6 days

SUBSTITUTION:

$$x = 3$$
$$y = 35 - 10x$$
$$y = 35 - 10(3)$$
$$y = 5$$

ALGEBRA:

$$\text{Apple} + \text{Apple} + \text{Apple} = 30$$
$$\text{Apple} + \text{Banana} + \text{Banana} = 18$$
$$\text{Banana} - \text{Coconut} = 2$$
$$\text{Coconut} + \text{Apple} + \text{Banana} = ??$$

PROBABILITY:



Rolling a 14



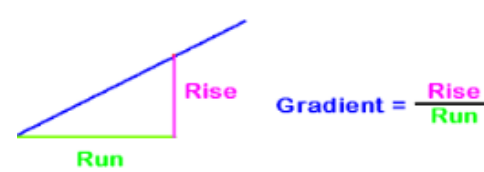
Heads



The sun will rise



GRADIENT:



INDICES:

The first rule: $a^n \times a^m = a^{m+n}$

The second rule: $(a^n)^m = a^{nm}$

The third rule: $a^m \div a^n = a^{m-n}$

The fourth rule: $a^0 = 1$

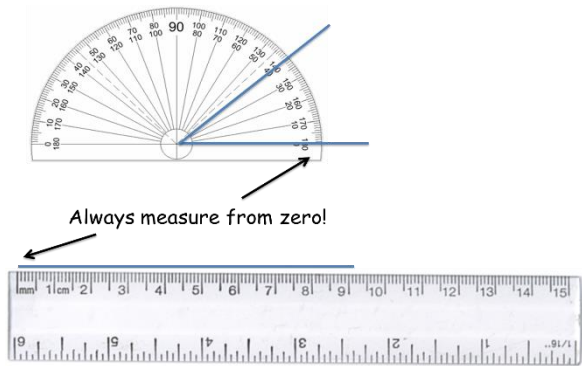
The fifth rule: $a^{-1} = \frac{1}{a}$ $a^m = \frac{1}{a^m}$

The sixth rule: $a^{1/2} = \sqrt{a}$ $a^{1/3} = \sqrt[3]{a}$

$$a^{n/m} = (a^{1/m})^n = (\sqrt[m]{a})^n$$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

MEASURING:

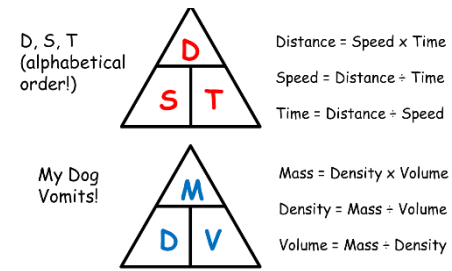


PLACE VALUE:

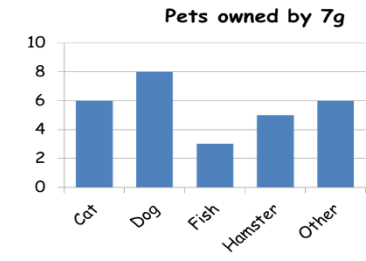
Th	H	T	U	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
	2	4	0	2	4	
			0	2	4	

$\times 10, 100, 1000, \dots$
 $\div 10, 100, 1000, \dots$
 $2.4 \times 100 = 240$ $2.4 \div 10 = 0.24$

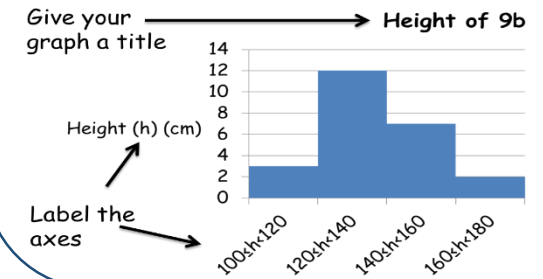
COMPOUND MEASURES:



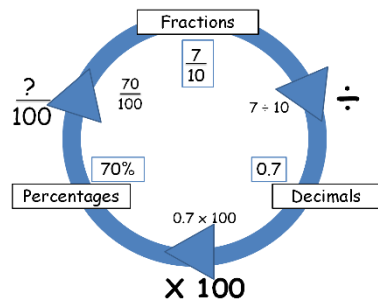
BAR CHARTS



Discrete data has gaps...
...Continuous data doesn't!



FRACTIONS, DECIMALS & PERCENTAGES:



PRIME NUMBERS:

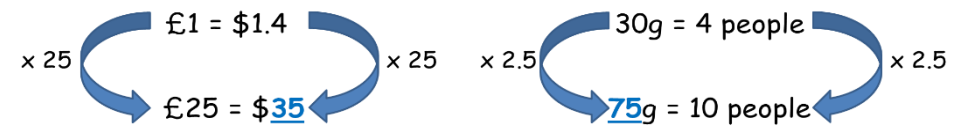
A prime number has only 2 factors, 1 and itself.

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, ...

WRITTEN METHODS:

Addition $3\ 456 + 975$ $\begin{array}{r} 3\ 456 \\ +\ 975 \\ \hline 4\ 431 \end{array}$		Subtraction $8003 - 2569$ $\begin{array}{r} 8\ 003 \\ -\ 2\ 569 \\ \hline 5\ 434 \end{array}$																					
Multiplication 327×53 Estimate: $300 \times 50 = 15\ 000$ <table border="1"> <tr> <td>X</td> <td>300</td> <td>20</td> <td>7</td> <td>Total</td> </tr> <tr> <td>50</td> <td>15 000</td> <td>1000</td> <td>350</td> <td>16 350</td> </tr> <tr> <td>3</td> <td>900</td> <td>60</td> <td>21</td> <td>981</td> </tr> <tr> <td>Total</td> <td>15900</td> <td>1060</td> <td>371</td> <td>17331</td> </tr> </table>		X	300	20	7	Total	50	15 000	1000	350	16 350	3	900	60	21	981	Total	15900	1060	371	17331	Division $351 \div 13$ Estimate: $350 \div 10 = 35$ $\begin{array}{r} 27 \\ 13 \overline{)351} \\ \underline{26} \\ 91 \\ \underline{91} \\ 0 \end{array}$	
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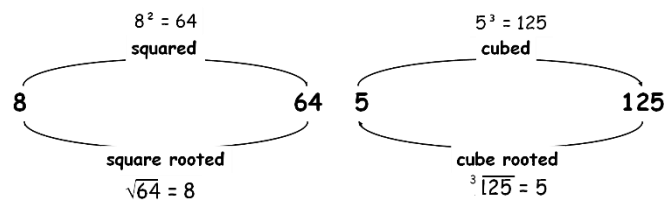
RATIO:



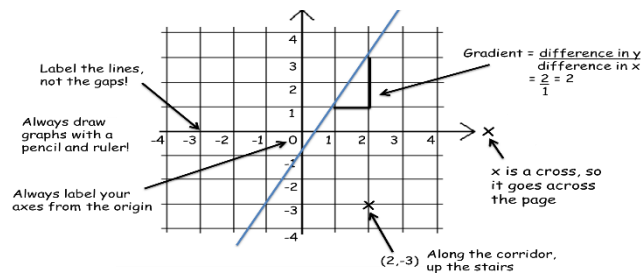
DIRECTED VALUES:

$-1 + 4 = 3$ $6 \times -2 = -12$
 $-18 \div -3 = 6$ $4 + -7 = -3$

SQUARES, CUBES AND ROOTS:



COORDINATES AND AXES:



METRIC UNITS:

The metric system of measurement is based on powers of ten and uses the following prefixes:

- (k) Kilo- meaning 1000
- (c) Centi- meaning one hundredth
- (m) Milli- meaning one thousandth

These prefixes are then followed by a **base unit**.

- The base unit for length is **metre (m)**
- The base unit for mass is **gram (g)**
- The base unit for capacity is **litre (l)**

We can convert between metric and imperial units using the following conversions.

Length	
1 inch (in) = 2.54 cm	1 cm = 0.394 in
1 yard (yd) = 0.91 m	1 m = 1.1 yd
1 mile = 1.609 km	1 km = 0.62 miles
Mass	
1 ounce (oz) = 28.35 g	1 g = 0.04 oz
1 pound (lb) = 0.45 kg	1 kg = 2.2 lb
1 stone = 6.35 kg	
Capacity	
1 fl oz = 28.4 ml	1 ml = 0.4 fl oz
1 pint = 0.57 l	1 l = 1.76 pints

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10