

# 1 - Basic Number

## Approximation

- We always round numbers to 1SF when estimating.
- When rounding to significant figures, we must remember that the 0s affect the value of the number.

e.g. 2SF  $\rightarrow 0.07 = 1SF$   
 $\rightarrow 0.070 = 2SF$

- We do not round the significant figures unless they are the last significant digit.

e.g. 3SF  $\rightarrow 3.6783 = 3.68$  (the 8 has been rounded up)

Estimation:  $59.98 \times 6.24 \approx 60 \times 6$  (1SF) = 360

## Prime Factors, HCF, LCM

- HCF  $\rightarrow$  multiply the common prime factors to get the HCF

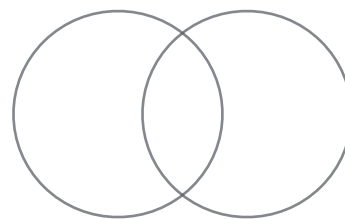
e.g.  $2 \times 2 = 4$

- LCM  $\rightarrow$  multiply all prime factors of the two numbers

e.g.  $3 \times 2 \times 2 \times 5 = 60$

- Remember that the centre of the venn diagram accounts for both sides. Combine the common into one value.

- Product of primes = prime numbers from tree diagrams sorted into format of  $a \times b \times c$



## Decimals

Multiplying two decimal numbers:

1. Multiply each decimal by a power of 10 to make it a whole number
2. Multiply the whole numbers
3. Multiply the powers of 10 from step 1
4. Divide the product of the numbers from step 2 by the power of 10 from step 3

e.g.  $3.42 \times 2.7 =$

1.  $3.42 \times 100, 2.7 \times 10 = 342$  and  $27$

2.  $342 \times 27 = 9234$

3.  $100 \times 10 = 1000$

4.  $9234 \div 1000 = 9.234$

Number of 0s when multiplying decimals = total 0s in answer

$0.2 \times 0.3 = 0.06$

$0.02 \times 0.03 = 0.0006$

Dividing by a decimal:

- Multiply both numbers by the same power of 10, so that the decimal is a whole number, then divide normally

e.g.  $42/0.2 \rightarrow 420/2 = 210$

## Squares and Roots

$5^2 = 5 \times 5 = 25$

$-5^2 = -5 \times 5 = -25$  (the - only belongs to one 5)

$(-5)^2 = -5 \times -5 = 25$  (everything in bracket  $^2$ )

$-(5)^2 = -(5 \times 5) = -25$  (everything in bracket  $^2$  then apply -)

$\sqrt{25} = 5$  ( $\pm$ )

$\sqrt{125} = 25$  ( $\pm$ )

$5^3 = 5 \times 5 \times 5 = 125$

$(-5)^3 = -5 \times -5 \times -5 = -125$

$-5^3 = -5 \times 5 \times 5$

$\sqrt[3]{27} = 3$

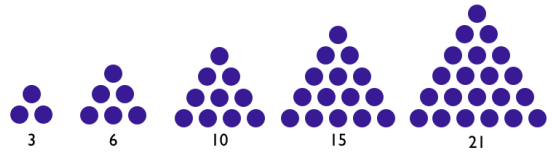
$\sqrt[3]{125} = 5$  (no  $\pm$  as the negative values cannot

be cubed to a + result)

$0.2^3 = 0.2 \times 0.2 \times 0.2 = 2 \times 2 \times 2 \div 1000 (8/1000) = 0.008$  (here we  $\times 10$  to each decimal then  $\div 10$  each decimal)

- Triangular Numbers  $\rightarrow$

1      3      6      10    15  
 +1    +2    +3    +4    +5



- Square Numbers  $\rightarrow$

4      9      16    25    36  
 $2^2$     $3^2$     $4^2$     $5^2$     $6^2$

- Cube Numbers  $\rightarrow$

8      27    64    125   216  
 $2^3$     $3^3$     $4^3$     $5^3$     $6^3$

$(a+b)c = (a + b) \times c$

**Fractions**

Multiplying by fractions

e.g.  $30 \times \frac{2}{5}$

1. Put integer over 1

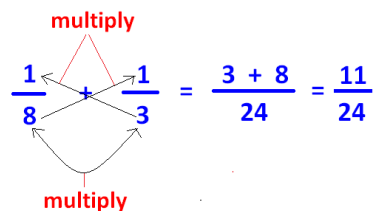
$\frac{30}{1} \times \frac{2}{5}$

2. Then do straight multiplication

$\frac{30}{1} \times \frac{2}{5} = \frac{60}{5}$   
 $1 \times 5 = 5$

**Cross multiplication**

Addition =



Equations =



**Dividing by Fractions**

- KCF - Keep, change, flip
- Keep first fraction
- change  $\div$  to  $\times$
- flip other fraction
- Simplify

$\frac{30}{1} \div \frac{2}{5} \rightarrow \frac{30}{1} \times \frac{5}{2} = \frac{150}{2} = 75$

**Equations**

If we have

$-x = 25$

Times everything by -1 to get positive x

so  $x = -25$