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 - )

$\sqrt{25} = 5$ ($\pm$)
$\sqrt{125} = 25$ ($\pm$)

$5^3 = 5 \times 5 \times 5 = 125$
$(-5)^3 = -5 \times -5 \times -5 = -125$
$\sqrt{27} = 3$
$-5^3 = -5 \times 5 \times 5$
\[ \sqrt[3]{125} = 5 \] (no ± as the negative values cannot be cubed to a + result)

\[ 0.2^3 = 0.2 \times 0.2 \times 0.2 = 2 \times 2 \times 2 \div 1000 = 0.008 \] (here we \( \times 10 \) to each decimal then \( \div 10 \) each decimal)

- Triangular Numbers →
  
  \[
  \begin{array}{cccccc}
  1 & 3 & 6 & 10 & 15 \\
  +1 & +2 & +3 & +4 & +5 \\
  \end{array}
  \]

- Square Numbers →
  
  \[
  \begin{array}{ccccccc}
  4 & 9 & 16 & 25 & 36 \\
  2^2 & 3^2 & 4^2 & 5^2 & 6^2 \\
  \end{array}
  \]

- Cube Numbers →
  
  \[
  \begin{array}{cccccccc}
  8 & 27 & 64 & 125 & 216 \\
  2^3 & 3^3 & 4^3 & 5^3 & 6^3 \\
  \end{array}
  \]

\[(a+b)c = (a + b) \times c\]

**Fractions**

Multiplying by fractions  
e.g. \( \frac{30}{5} \times \frac{2}{5} \)

1. Put integer over 1  
   \[ \frac{30}{1} \times \frac{2}{5} \]
2. Then do straight multiplication  
   \[ \frac{30}{1} \times \frac{2}{5} = \frac{60}{5} = 12 \]

**Cross multiplication**

Addition =

Equations =

\[
\frac{a}{b} = \frac{c}{d} \quad \rightarrow \quad ad = bc
\]

**Dividing by Fractions**

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

\[
\frac{30}{1} \div \frac{2}{5} \quad \rightarrow \quad \frac{30 \times 5}{2} = 75
\]

**Equations**

If we have  
- \( -x = 25 \)

Times everything by -1 to get positive \( x \)

so \( x = -25 \)