

Simple Algebra.Algebraic Expressions: Eg.  $A+B$ ,  $\frac{2x}{a}$ ,  $y$ 

They do not include an equals sign.

Substitution: Eg.  $m=5$ ,  $n=-6$ 

Place brackets around substituted numbers

$$\begin{aligned} & 3m-n \\ & = 3(5) - (-6) \\ & = 15 + 6 \\ & = 21 \end{aligned}$$

Like Terms: Only  $+/-$  when the pronumerals are exactly the same.When  $+/-$ , group like terms and add separately

$$\begin{aligned} \text{Eg. } & \boxed{14r} + \boxed{4t} - \boxed{2r} + \boxed{3t} \\ & = 12r + 7t \end{aligned}$$

Place  $\circ$  or  $\square$  around like terms. Remember the  $+/-$  sign before the term.Expanding & Factorising

$$\begin{aligned} \text{Expanding: Eg. } & 7(m+3) \\ & = 7m + 21 \end{aligned}$$

 $7(m+3)$  is also

$$7 \times (m+3), \text{ so: } (7 \times m) + (7 \times 3)$$

Factorising: Find the HCF first.

$$\begin{aligned} & 3x + 6 \\ & \div 3 \quad \div 3 \end{aligned}$$

HCF is 3.

Divide each term by the HCF (3).

$$\begin{aligned} \text{write this as 1 step. } & \left[ \begin{aligned} & = x + 2 \\ & = 3(x + 2) \end{aligned} \right. \end{aligned}$$

Add the 3 and brackets.

Index Laws

$$a^m \times a^n = a^{m+n} : \text{Eg. } p^6 \times p^3 = p^{6+3} = p^9$$

$$a^m \div a^n = a^{m-n} : \text{Eg. } p^{12} \div p^8 = p^{12-8} = p^4$$

$$(a^m)^n : \text{Eg. } (p^2)^5 = p^{2 \times 5} = p^{10}$$

$$\nabla \text{ NOTE } (2^8)^2 = 2^{8 \times 2} = 2^{16}$$

Treat 2 as an x.

Other Rules

(That might be in the test)

$$a^0 = 1 : \text{Eg. } 12^0 = 1$$

$$a^{\frac{1}{2}} = \sqrt{a} : \text{Eg. } 9^{\frac{1}{2}} = \sqrt{9} = 3$$

$$a^{\frac{1}{3}} = \sqrt[3]{a} : \text{Eg. } 27^{\frac{1}{3}} = \sqrt[3]{27} = 3$$

$$a^{-1} = \frac{1}{a} : \text{Eg. } 6^{-1} = \frac{1}{6}$$

$$a^{-2} = \frac{1}{a^2} : \text{Eg. } 6^{-2} = \frac{1}{6^2} = \frac{1}{36}$$

HARD QUESTIONS

$$\begin{array}{l} x(y+2) + 3(y+2) \\ \underbrace{\hspace{1cm}} \quad \underbrace{\hspace{1cm}} \\ \text{HCF} \\ = (y+2)(x+3) \end{array}$$

$$\begin{array}{l} \frac{2x}{5} + \frac{3y}{5} \\ = \frac{1}{5}(2x+3y) \end{array}$$

$$\begin{array}{l} x^2 + 10x + 24 \\ = (x \quad)(x \quad) \\ = (x+6)(x+4) \end{array}$$

$$\begin{array}{l} -2(g+4) - x(g-4) \\ = (g-4)( \quad) \\ = (g-4)(-2-x) \\ = -(g-4)(2+x) \end{array}$$