Revision for Algebra

Name:

SUBSTITUTING VALUES:

Calculate if $y = 4$

1. $y^2 = 4^2 = 4 \times 4 = 16$

2. $3y = 3 \times 4 = 12$

3. $6y^2 + 2y = 6 \times 4^2 + 2 \times 4 = 6 \times 16 + 2 \times 4 = 104$

If $b = 6$ and $x = 3$ calculate $3bx$ $3 \times 6 \times 3 = 54.$

MULTIPLYING TERMS:

Simplify:

1. $4c \times 2a \times b$ $8abc$

2. $2y \times 3y \times 4x^2$ $24x^2y^2$

3. $y \times y^4 \times 5y$ $5y^6$

Try and write letters in alphabetical order.

EXPAND:

1. $2(x + 4)$ $2x + 8$ $2 \times x$ 2×4

2. $5(y + 2)$ $5y + 10$ $5 \times y$ 5×2

3. $-6(8 - y)$ $-48 + 6y$ -6×8 $-6 \times -y = +6y$

4. $2(x + y + 5)$ $2x + 2y + 10$

FACTORISE:

1. $6y + 18$

$6 \times y \quad 6 \times 3$ $\quad \underline{6(y+3)}$

2. $5x - 10$

$5 \times x \quad 5 \times 2$ $\quad \underline{5(x-2)}$

3. $x^2 - 2x$

$x \times x \quad 2 \times x$ $\quad \underline{x(x-2)}$

4. $27x + 54$

$27 \times x \quad 27 \times 2$ $\quad \underline{27(x+2)}$

Find 'common' thing(s) and pull out the front

SIMPLIFY:

1. $2cd + 8 + 5cd = \underline{7cd + 8}$

2. $8xy - 8x + 2xy = \underline{10xy - 8x}$

add together 'like' terms

3. $3y^2 \times -2y^3 = \underline{-6y^5}$

4. $-2y \times \frac{1}{2}y^2 = -1y^3 = \underline{-y^3}$

$-2 \times \frac{1}{2} = -1$

'mush' together when x.

SIMPLIFY:

1. $\frac{16t}{4w} = \frac{\cancel{4} \times 4 \times t}{\cancel{4} \times w} = \underline{\frac{4t}{w}}$

2. $\frac{20x^2y^3}{4x^4y} \quad \frac{\cancel{4} \times 5 \cancel{x}\cancel{x} y y \cancel{y}}{\cancel{4} \cancel{x}\cancel{x} x x \cancel{y}} = \underline{\frac{5y^2}{x^2}}$

3. $\frac{16c^2d^3}{2d} = \frac{\cancel{2} \times 8 \; c c d d \cancel{d}}{\cancel{2}\cancel{d}} = \underline{8c^2d^2}$

cancel with things is on top + btm.

SIMPLIFY:

1. $m^2 \times m^3 \times m^4$ $= m^9$

2. $y^2 \times y^3 \times y$ $= y^6$

3. $\frac{12m^3}{3m}$ $= \frac{4 \times \cancel{3}\, \cancel{m}mm}{\cancel{3}\, \cancel{m}} = 4m^2$

4. $\frac{w^3y^7}{wy^4}$ $\frac{wwwyyyyyyy}{wyyyy} = w^2y^3$

EXPAND:

1. $2c(c + 3d)$ $= 2c^2 + 6cd$

$2c \times c$
$2c \times 3d$

2. $-4y(x - y)$ $= -4xy + 4y^2$

$-4y \times x = -4xy$
$-4y \times -y = +4y^2$

3. $3w(2w + 4) + 5w$ $= 6w^2 + 12w + 5w$ expand 1st then simplify.
$= 6w^2 + 17w$

4. $-y(7 - y)$ $= -7y + y^2$

$-y \times 7$
$-y \times -y$

5. $-y(7 - y)$
oops same!

FACTORISE:

1. $2x^2 + 6x$ $=$ $2x(x + 3)$
$\cancel{2} \times \cancel{x} \times x + \cancel{2} \times 3 \times \cancel{x}$

2. $9cd + 12c^2dx$
$\cancel{3} \times 3 \times \cancel{c} \times \cancel{d} + \cancel{3} \times 4 \times \cancel{c}c\cancel{d}x = 3cd(3 + 4cx)$

3. $5x^3y^4z + 10xy^2z^2$
$\cancel{5}\cancel{x}xx\cancel{y}\cancel{y}\cancel{y}y\cancel{z}$ $\cancel{5} \times 2\cancel{x}\cancel{y}\cancel{y}z\cancel{z}$ $= 5xy^2z(x^2y^2 + 2z)$

4. $xy - 2xy^2$
$\cancel{xy}$ $2x\cancel{y}y$ $xy(1 - 2y)$

SOLVE EQUATIONS:

1. $x - 1 = 8$ $\quad +1 \quad +1$ $\qquad x = 9$

2. $2x - 4 = 8$ $\quad +4 \quad +4$ $\qquad 2x = 12 \Rightarrow x = 6 \quad (\div 2)$

3. $5c - 9 = 11$ $\quad +9 \quad +9$ $\qquad 5c = 20 \Rightarrow x = 4 \quad (\div 4)$

4. $\frac{c}{4} - 8 = 0$ $\quad +8 \quad 8$ $\qquad \frac{c}{4} = 8 \quad \times \quad \Rightarrow c = 32 \quad (\times 4)$

5. $6(y - 2) = 60$ $\qquad 10 \ (6 \times 10 = 60)$ $\qquad y - 2 = 10 \quad +2 \quad +2 \qquad y = 12$

6. $6c - 4 = 3c + 2$ $\qquad 3c - 4 = +2 \quad +4 \quad +4 \qquad 3c = 6 \qquad c = 2$

7. $5x + 2 = 0$ $\quad -2 \quad -2$ $\qquad 5x = -2 \qquad x = \frac{-2}{5} \quad (\div 5)$

FACTORISE QUADRATICS:

1. $x^2 + 5x + 6$ $\qquad 2 \times 3 \quad 2 \times 3 \qquad (x + 2)(x + 3)$

2. $x^2 - 9$ $\qquad -3 \times 3 \ (-3 \times 3) \qquad x^2 + 0x - 9 \qquad (x - 3)(x + 3)$

3. $x^2 - 1x - 12$ $\qquad -4 + 3 = -1 \qquad -4 \times 3 = -12 \qquad (x - 4)(x + 3)$

4. $x^2 + 15x + 50$ $\qquad 10 \times 5 \qquad 10 + 5 \qquad (x + 10)(x + 5)$

2 Numbers that × to get last number and add to get number in front of the x.
⇒ go into brackets

EXPAND AND SIMPLIFY:

1. $(x + 3)(x + 3)$

	x	$+3$
x	x^2	$+3x$
$+3$	$+3x$	$+9$

$x^2 + 6x + 9$

2. $(x - 4)(x - 2)$

	x	-4
x	x^2	$-4x$
-2	$-2x$	$+8$

$x^2 - 6x + 8$

3. $(2x + 1)(3x - 2)$

	$2x$	$+1$
$3x$	$6x^2$	$+3x$
-2	$-4x$	-2

$6x^2 - 1x - 2$

4. $(2 - x)(x + 4)$

	2	$-x$
x	$2x$	$-x^2$
$+4$	$+8$	$-4x$

$-x^2 - 2x + 8$