

ALGEBRAIC EXPRESSIONS

EXPRESSIONS

- An **expression** is different from an **equation**.
- An expression **HAS NO** equal sign
- You simplify an expression

Expression

$$w + 4w - 2w$$

Equation

$$w + 4 = 6$$

Examples

1. a number subtracted from five

$$5 - x$$

2. five less than a number

$$x - 5$$

- The expression is **evaluated** by **substituting** a GIVEN value for the variable

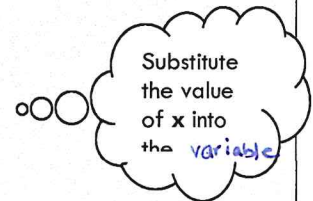
Examples

If $x = 2$ evaluate $5 - x$

$$\begin{aligned} &= 5 - (2) \\ &= 3 \end{aligned}$$

2. If $x = 1$ evaluate $x - 5$

$$\begin{aligned} &= (1) - 5 \\ &= -4 \end{aligned}$$



Examples

1. If $w = -7$, evaluate: [SUBSTITUTE, THEN SIMPLIFY]

a) $-3w$

$$\begin{aligned} &= -3(-7) \\ &= 21 \end{aligned}$$

b) w^2

$$\begin{aligned} &= (-7)^2 \\ &= 49 \end{aligned}$$

c) $w^2 + 2w - 4$

$$\begin{aligned} &= (-7)^2 + 2(-7) - 4 \\ &= 49 + 2(-7) - 4 \\ &= 49 - 14 - 4 \\ &= 35 - 4 \\ &= 31 \end{aligned}$$

2. If $x = 2$ and $y = 3$, evaluate:

$$\begin{aligned} \text{a) } 2x + y \\ &= \underline{2(2)} + \underline{(3)} \\ &= 4 + 3 \\ &= 7 \end{aligned}$$

$$\begin{aligned} \text{b) } 3x^2 - 2x + y \\ &= \underline{3(2)^2} - \underline{2(2)} + \underline{(3)} \\ &= \underline{3(4)} - \underline{2(2)} + 3 \\ &= \underline{12 - 4} + 3 \\ &= \underline{8} + 3 \\ &= 11 \end{aligned}$$

$$\begin{aligned} \text{c) } y^2 - x^2 \\ &= \underline{(3)^2} - \underline{(2)^2} \\ &= 9 - 4 \\ &= 5 \end{aligned}$$

3. If $x = 2$ and $y = -4$, evaluate:

$$\begin{aligned} \text{a) } x^2 + y \\ &= \underline{(2)^2} + \underline{(-4)} \\ &= 4 - 4 \\ &= 0 \end{aligned}$$

$$\begin{aligned} \text{b) } (x + y)^3 \\ &= \underline{[(2) + (-4)]^3} \\ &= \underline{(-2)^3} \\ &= -8 \end{aligned}$$

$$\begin{aligned} \text{c) } x(y - 2) \\ &= \underline{(2)} \underline{[(-4) - 2]} \\ &= 2(-6) \\ &= -12 \end{aligned}$$

$$\begin{aligned} \text{d) } -0.10x^2 - 3.12x + 10 \\ &= -0.10(\underline{2})^2 - 3.12(2) + 10 \\ &= -0.10(4) - 3.12(2) + 10 \\ &= \underline{-0.40 - 6.24} + 10 \\ &= -6.64 + 10 \\ &= 3.36 \end{aligned}$$

$$\begin{aligned} \text{e) } y^2 - 8y + 10 \\ &= \underline{(-4)^2} - 8(-4) + 10 \\ &= 16 - 8(\underline{-4}) + 10 \\ &= \underline{16 + 32} + 10 \\ &= 48 + 10 \\ &= 58 \end{aligned}$$

Ratios

A comparison of two quantities measured in the same units

Examples

Write the following ratios in simplest form

$$\begin{aligned} \text{a) } 10:5 & \quad \div 5 \\ &= 2:1 \end{aligned}$$

$$\begin{aligned} \text{b) } 16:20 & \quad \div 4 \\ &= 4:5 \end{aligned}$$

$$\begin{aligned} \text{c) } 24:72 & \quad \div 24 \\ &= 1:3 \end{aligned}$$