

5/08/21

Exercise 20(B)

1. Evaluate

$$\begin{aligned} \text{i) } (23-15) + 4 \\ = 8 + 4 \\ = 12 \end{aligned}$$

$$\begin{aligned} \text{ii) } 5x + (3x + 7x) \\ = 5x + 10x \\ = 15x \end{aligned}$$

$$\begin{aligned} \text{iii) } 6m - (4m - m) \\ = 6m - 3m \\ = 3m \end{aligned}$$

$$\begin{aligned} \text{iv) } (9a - 3a) + 4a \\ = 6a + 4a \\ = 10a \end{aligned}$$

$$\begin{aligned} \text{v) } 35b - (16b + 9b) \\ = 35b - 25b \\ = 10b \end{aligned}$$

$$\begin{aligned} \text{vi) } (3y + 8y) - 5y \\ = 11y - 5y \\ = 6y \end{aligned}$$

2. Simplify:

$$\begin{aligned} \text{i) } 12x - (5x + 2x) \\ = 12x - 7x = 5x \end{aligned}$$

$$\begin{aligned} \text{ii) } 10m + (4n - 3n) - 5n \\ = 10m + 1n - 5n \\ = 10m + (-4n) = 10m - 4n \end{aligned}$$

$$\begin{aligned} \text{iii) } (15b - 6b) - (8b + 4b) \\ = 9b - 12b \\ = -3b \end{aligned}$$

$$\begin{aligned} \text{iv) } -(-4a - 8a) \\ = -(-12a) = 12a \end{aligned}$$

$$\begin{aligned} \text{v) } x - (x - y) - (-x + y) \\ = x - x + y + x - y \\ = x \end{aligned}$$

$$\begin{aligned} \text{vi) } p + (-q - r - s) - (p - q - r) \\ = p - q - r - s - p + q + r \\ = -s \end{aligned}$$

$$\begin{aligned} \text{vii) } (a+b) - (c+d) - (e-f) \\ = a+b-c-d-e+f \end{aligned}$$

$$\begin{aligned} \text{viii) } 3x + (8x - 5x) - (7x - x) \\ = 3x + 8x - 5x - 7x + x \\ = 12x - 12x = 0 \end{aligned}$$



$$\begin{aligned} \text{ix) } a(a-b-c) \\ &= a - a + b + c \\ &= b + c \end{aligned}$$

$$\begin{aligned} \text{(x) } 6a^2 + (2a^2 - a^2) - (a^2 - b^2) \\ &= 6a^2 + 2a^2 - a^2 - a^2 + b^2 \\ &= 8a^2 - 2a^2 + b^2 \\ &= 6a^2 + b^2 \end{aligned}$$

$$\begin{aligned} \text{xii) } 2m - (3m + 2n - 6n) \\ &= 2m - 3m - 2n + 6n \\ &= -m + 4n = 4n - m \end{aligned}$$

$$\begin{aligned} \text{(xii) } -m - n - (-m) - m \\ &= -m - n + m - m \\ &= -m - n \end{aligned}$$

$$\begin{aligned} \text{xiii) } x + y - (x + y - x) \\ &= x + y - (x + y - x) \\ &= x + y - x - y + x \\ &= x \end{aligned}$$

$$\begin{aligned} \text{(xiv) } 25y - (5x - 10y + 6x - 3y) \\ &= 25y - 5x + 10y - 6x + 3y \\ &= 25y + 10y + 3y - 5x - 6x \\ &= 38y - 11x \end{aligned}$$

$$\begin{aligned} \text{(xv) } 3x + (2x - x + 2) \\ &= 3x + (2x - x + 2) \\ &= 3x + 2x - x + 2 \\ &= 5x - x + 2 \\ &= 4x + 2 \end{aligned}$$

$$\begin{aligned} \text{(xvi) } a - (2a - 4a + 3a) \\ &= a - (2a - 4a + 3a) \\ &= a - 2a + 4a + 3a \\ &= 8a - 2a \\ &= 6a \end{aligned}$$

$$\begin{aligned} \text{(xvii) } 5x^2 - (3x - x^2 - 4) \\ &= 5x^2 - (3x - x^2 + 4) \\ &= 5x^2 - 3x + x^2 - 4 \\ &= 5x^2 + x^2 - 3x - 4 \\ &= 6x^2 - 3x - 4 \end{aligned}$$

$$\begin{aligned} \text{(xviii) } -(y - x) - (x + y - 2x + y) \\ &= -(y - x) - (x + y - 2x + y) \\ &= -y + x - x - y + 2x + y \\ &= 2x - y \end{aligned}$$

3- Simplify:

$$i) x - (y - z) + x + (y - z) + y - (z + x)$$

$$= \cancel{x} - \cancel{y} + \cancel{z} + x + \cancel{y} - \cancel{z} + y - z - \cancel{x}$$

$$= x + y - z$$

$$ii) x - [y + \{x - (y + x)\}]$$

$$= x - [y + \{x - y - x\}]$$

$$= x - [y + x - y - x]$$

$$= \cancel{x} - \cancel{y} - \cancel{x} + y + x = x$$

$$iii) 4x + 3(2x - 5y) = 4x + 3 \times 2x - 3 \times 5y$$

$$= 4x + 6x - 15y$$

$$= 10x - 15y$$

$$iv) 2(3a - b) - 5(a - 3b)$$

$$= 2 \times 3a - 2 \times b - 5 \times a + 5 \times 3b$$

$$= 6a - 2b - 5a + 15b$$

$$= 6a - 5a - 2b + 15b$$

$$= a + 13b$$

$$v) p + 2(q - \pi + p)$$

$$= p + 2(q - \pi - p)$$

$$= p + 2 \times q - 2 \times \pi - 2 \times p$$

$$= p + 2q - 2\pi - 2p = p - 2p + 2q - 2\pi = 2q - p - 2\pi$$

$$\begin{aligned}
 \text{vi)} \quad & a - [-\{- (a-b-c)\}] \\
 & = a - [-\{- (a-b+c)\}] \\
 & = a - [-\{-a+b-c\}] \\
 & = a - [+a-b+c] \\
 & = a - a + b - c \\
 & = b - c
 \end{aligned}$$

$$\begin{aligned}
 \text{vii)} \quad & 3x - [5y - \{6y + 2(10y - x)\}] \\
 & = 3x - [5y - \{6y + 2 \times 10y - x \times 2\}] \\
 & = 3x - [5y - \{6y + 20y - 2x\}] \\
 & = 3x - [5y - \{26y - 2x\}] \\
 & = 3x - [5y - 26y + 2x] \\
 & = 3x - [-21y + 2x] \\
 & = 3x - 2x + 21y \\
 & = x + 21y
 \end{aligned}$$

$$\begin{aligned}
 \text{viii)} \quad & 5 \{a^2 - a(a-a-2)\} \\
 & = ~~5a^2 - 5a~~ \\
 & = 5 \{a^2 - a(a-a+2)\} \\
 & = 5 \{a^2 - a \times a + a \times a - a \times 2\} \\
 & = 5 \{a^2 - \cancel{a^2} + \cancel{a^2} - 2a\} \\
 & = 5a^2 - 5 \cdot 2a \\
 & = 5a^2 - 10a
 \end{aligned}$$