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Chapter 15 Substitution

Exercise - 20 - A Q. 1

Exercise - 20 - B Q. 2

Exercise - 20 - C Q. 1

Exercise - 20 - A

Q. 3 - ~~(i) 453 x 2~~

3. Find the value of:

(i) ~~4 x 5 x 3 x 2 x 1/2~~

~~= 60 x 2 x 1/2~~

~~= 60 x 2 x 1/2~~

= 120 x $\frac{1}{2}$ = $\frac{120}{2}$ = 60

(ii) $\frac{y \times x}{z} = \frac{y \times x}{z} = \frac{4 \times 8}{16} = \frac{32}{16} = 2$

(iii) $\frac{a + b - c}{2a} = \frac{5 + 7 - 2}{2 \times 5} = \frac{10}{10} = 1$

Exercise 20-13

Q-2- Simplify

$$(i) 12x - (5x + 2x)$$

$$= 12x - 7x$$

$$= 5x$$

$$(ii) 10m + (4n - 3n) - 5n$$

$$= 10m + 1n - 5n$$

$$= 10m + (-4n)$$

$$(iii) (15b - 6b) - (8b + 4b)$$

$$= 9b - 12b$$

$$= -3b$$

$$(iv) -(-4a - 8a)$$

$$= 4a + 8a$$

$$= 12a$$

$$(v) x - (x - y) - (-x + y)$$

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

$$= x$$

$$(vi) p + (-q - r - s) - (p - q - r)$$

$$= p - q - r - s - p + q + r$$

$$= -s$$

$$(vii) (a + b) - (c + d) - (e - f)$$

$$= a + b - c - d - e + f$$

$$(viii) 3x + (8x - 5x) - (7x - x)$$

$$\cancel{3x} + \cancel{8x} - \cancel{5x} - \cancel{7x} + \cancel{x}$$

$$= 3x + 8x - 5x - 7x + x$$

$$= 3x + 8x + x - 5x - 7x$$

$$= 12x - 12x$$

$$= 0$$

$$(ix) a - (a - b - c)$$

$$= \cancel{a} - \cancel{a} + b + c$$

$$= b + c$$

$$\begin{aligned}
 \text{(X)} \quad & 6a^2 + (2a^2 - a^2) - (a^2 + 1) \\
 & = 6a^2 + 2a^2 - a^2 - a^2 - 1 \\
 & = \cancel{6a^2 + 2a^2 - 2a^2} \\
 & = 6a^2 - 2a^2 + b^2 \\
 & = 6a^2 + b^2
 \end{aligned}$$

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

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

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

$$(Xiv) 25y - (5x - 10y + 6x - 3y)$$

$$= 25y - 5x + 10y - 6x + 3y$$

$$= 25y + 10y + 3y = 38y$$

$$= 5x + 6x = 11x$$

$$= 38y - 11x$$

$$(Xv) 3x + (2x - x + 2)$$

$$= 3x + 2x - x + 2$$

$$= 3x + 2x = 5x - x = 4x$$

$$= 4x + 2 = 4x - 2$$

~~$$(Xvi) a - (2a - 4a + 3a)$$~~

~~$$= a - 2a + 4a - 3a$$~~

~~$$= a - 2a = 4a - 3a = 5a - 3a = 2a$$~~

$$(Xvi) a - (2a - 4a + 3a)$$

$$= a - 2a + 4a - 3a$$

$$= -1a + 4a = 3a + 3a$$

$$= 6a$$

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$$(xvii) 5x^2 - (3x - x^2 - 4)$$

$$= 5x^2 - 3x + x^2 + 4$$

$$= 5x^2 + x^2 = 6x^2$$

$$= 6x^2 - 3x - 4$$

$$(xviii) -(y - x) - (x + y - 2x)$$

$$= -y + x - x - y + 2x - y$$

$$= 2x - y$$

Exercise 20(c)

(i) $b - c$

(ii) $z - y$

(iii) $5x - a$

(iv) $b - c + d$

(v) $2c - 5a - 4b$

(vi) $7x + 2z$

(vii) $2n - 3m$

(viii) $P + Q + S$

————— x —————