EXERCISE 20(B)

Question 1.

Evaluate :

(i) (23 – 15) + 4

(ii) 5x + (3x + 7x)

(iii) 6m – (4m – m)

(iv) (9a – 3a) + 4a

(v) 35b – (16b + 9b)

(vi) (3y + 8y) – 5y

Solution:

(i) (23 – 15) + 4 = 8 + 4 = 12

(ii) 5x + (3x + 7x) = 5x + 10x = 15x

(iii) 6m – (4m – m) = 6m – 3m = 3m

(iv) (9a – 3a) + 4a = 6a + 4a = 10a

(v) 35b – (16b + 9b)= 35b – 25b = 10b

(vi) (3y + 8y) – 5y = 11y – 5y = 6y

Question 2.

Simplify :

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

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

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

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

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

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

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

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

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

(x) $6a^2 + (2a^2 - a^2) - (a^2 - b^2)$

(xi) $2m - (3m + 2n - 6n)$

(xii) $-m - n - (-m) - m$

(xiii) $x + y - (x + \overline{y - x})$

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

(xv) $3x + (2x - \overline{x + 2})$

(xvi) $a - (2a - \overline{4a + 3a})$

(xvii) $5x^2 - (3x - \overline{x^2 - 4})$

(xviii) $-(y - x) - (x + y - \overline{2x + y})$

Solution:

(*i*) $12x - (5x + 2x) = 12x - 7x = \mathbf{5x}$

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

$= 10\ m + n - 5n = \mathbf{10m - 4n}$

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

$= 9b - 12b = \mathbf{-3b}$

(*iv*) $-(-4a - 8a) = -(-12a) = \mathbf{12a}$

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

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

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

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

$= p - p - q + q - r + r - s = \mathbf{-s}$

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

$= \mathbf{a + b - c - d - e + f}$

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

$= 3x + 3x - 6x = 6x - 6x = \mathbf{0}$

(*ix*) $a - (a - b - c) = a - a + b + c$

$= \mathbf{b + c}$

(*x*) $6a^2 + (2a^2 - a^2) - (a^2 - b^2)$

$= 6a^2 + a^2 - a^2 + b^2 = \mathbf{6a^2 + b^2}$

(*xi*) $2m - (3m + 2n - 6n)$

$= 2m - 3m - 2n + 6n$

$= -m + 4n = \mathbf{4n - m}$

(*xii*) $-m - n - (-m) - m$

$= -m - n + m - m = \mathbf{-m - n}$

(*xiii*) $x + y - (x + \overline{y - x})$

$= x + y - (x + y - x)$

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

$= x - x + x + y - y = \mathbf{x}.$

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

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

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

$= \mathbf{38y - 11x}$

(*xv*) $3x + (2x - \overline{x + 2})$

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

$= 3x + 2x - x - 2 = \mathbf{4x - 2}$

(xvi) $a - (2a - \overline{4a + 3a})$

$= a - (2a - 4a - 3a)$

$= a - 2a + 4a + 3a = 8a - 2a = \mathbf{6a}.$

(xvii) $5x^2 - (3x - \overline{x^2 - 4})$

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

$= 5x^2 + x^2 - 3x - 4 = \mathbf{6x^2 - 3x - 4}$

(xviii) $-(y - x) - (x + y - \overline{2x + y})$

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

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

$= x - x + 2x - y - y + y = \mathbf{2x - y}$

Question 3.

Simplify :

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

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

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

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

(v) $p + 2\,(q - \overline{r + p})$

(vi) $a - [-\{-(a - \overline{b - c})\}]$

(vii) $3x - [5y - \{6y + 2\,(10y - x)\}]$

(viii) $5\{a^2 - a(a - \overline{a - 2})\}$

Solution:

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

$= x-y+z+x+y-z+y-z-x$

$= x+x-x-y+y+y+z-z-z$

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

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

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

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

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

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

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

$= 4x+6x-15y$

$= \mathbf{10x-15y}$

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

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

$= 6a-5a+15b-2b = \mathbf{a+13b}$

(v) $p+2(q-\overline{r+p})$

$= p+2(q-r-p)$

$= p+2q-2r-2p = \mathbf{2q-2r-p}$

(vi) $a-[-\{-(a-\overline{b-c})\}]$

$= a-[-\{-(a-b+c)\}]$

$= a-[-\{-a+b-c\}]$

$= a-[+a-b+c]$

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

(vii) $3x-[5y-\{6y+2(10y-x)\}]$

$= 3x-[5y-\{6y+20y-2x\}]$

$= 3x-[5y-6y-20y+2x]$

$= 3x-5y+6y+20y-2x$

$= 3x-2x+6y+20y-5y$

$= \mathbf{x+21y}$

(viii) $5\{a^2-a(a-\overline{a-2})\}$

$= 5\{a^2-a(a-a+2)\}$

$= 5\{a^2-a^2+a^2-2a)$

$= 5a^2-5a^2+5a^2-10a$

$= \mathbf{5a^2-10a}$