

RD Sharma
Solutions

Class 7

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Exercise 7.4

Simplify each of the following algebraic expression by removing grouping symbols.

$$\begin{aligned} 1. \quad 2x + (5x - 3y) &= 2x + 5x - 3y \\ &= (2x + 5x) - 3y = 7x - 3y \end{aligned}$$

$$\begin{aligned} 2. \quad 3x - (y - 2x) &= 3x - y + 2x \\ &= (3x + 2x) - y = 5x - y \end{aligned}$$

$$\begin{aligned} 3. \quad 5a - (3b - 2a + 4c) &= 5a - 3b + 2a - 4c \\ &= (5a + 2a) + (-3b) + (-4c) \\ &= 7a - 3b - 4c \end{aligned}$$

$$\begin{aligned} 4. \quad -2(x^2 - y^2 + xy) - 3(x^2 + y^2 - xy) \\ &= -2x^2 + 2y^2 - 2xy - 3x^2 - 3y^2 + 3xy \\ &= (-2x^2 - 3x^2) + (2y^2 - 3y^2) + (-2xy + 3xy) \\ &= -5x^2 - y^2 + xy \end{aligned}$$

$$\begin{aligned} 5. \quad 3x + 2y - \{x - (2y - 3)\} \\ &= 3x + 2y - (x - 2y + 3) \\ &= 3x + 2y - x + 2y - 3 \\ &= (3x - x) + (2y + 2y) - 3 = 2x + 4y - 3 \end{aligned}$$

$$\begin{aligned}
 \text{Q.6. } & 5a - \{3a - (2-a) + 4\} \\
 &= 5a - \{3a - 2 + a + 4\} \\
 &= 5a - \{(3a+a) + (-2+4)\} = 5a - \{4a+2\} \\
 &= 5a - 4a - 2 \\
 &= a - 2
 \end{aligned}$$

$$\begin{aligned}
 \text{Q.7 } & a - [b - \{a - (b-1) + 3a\}] \\
 &= a - [b - \{a - b + 1 + 3a\}] \\
 &= a - [b - \{4a - b + 1\}] \\
 &= a - [b - 4a + b - 1] = a - [2b - 4a - 1] \\
 &= a - 2b + 4a + 1 \\
 &= 5a - 2b + 1
 \end{aligned}$$

$$\begin{aligned}
 \text{Q.8 } & a - [2b - \{3a - (2b-3c)\}] \\
 &= a - [2b - \{3a - 2b + 3c\}] \\
 &= a - [2b - 3a + 2b - 3c] \\
 &= a - [4b - 3a - 3c] \\
 &= a - 4b + 3a + 3c \\
 &= 4a - 4b + 3c
 \end{aligned}$$

$$\begin{aligned}
 \text{Q.9} \quad & -x + [5y - \{2x - (3y - 5x)\}] \\
 &= -x + [5y - \{2x - 3y + 5x\}] \\
 &= -x + [5y - (7x - 3y)] \\
 &= -x + [5y - 7x + 3y] \\
 &= -x + [8y - 7x] = -x + 8y - 7x \\
 &= -8x + 8y
 \end{aligned}$$

$$\begin{aligned}
 \text{Q.10} \quad & 2a - [4b - \{4a - 3(2a - b)\}] \\
 &= 2a - [4b - \{4a - 6a + 3b\}] \\
 &= 2a - [4b - \{-2a + 3b\}] \\
 &= 2a - [4b + 2a - 3b] \\
 &= 2a - [b + 2a] = 2a - b - 2a \\
 &= 0 - b = -b
 \end{aligned}$$

$$\begin{aligned}
 \text{Q.11} \quad & -a - [a + \{a + b - 2a - (a - 2b)\} - b] \\
 &= -a - [a + \{a + b - 2a - a + 2b\} - b] \\
 &= -a - [a + \{(a - 2a - a) + (b + 2b)\} - b] \\
 &= -a - [a + (-2a + 3b) - b] \\
 &= -a - [(a - 2a) + (3b - b)] = -a - [-a + 2b] \\
 &= -a + a - 2b = 0 - 2b = -2b
 \end{aligned}$$

$$\underline{Q.12} \quad 2x - 3y - [3x - 2y - \{x - z - (x - 2y)\}]$$

$$= 2x - 3y - [3x - 2y - \{x - z - x + 2y\}]$$

$$= 2x - 3y - [3x - 2y - \{(x - x) - z + 2y\}]$$

$$= 2x - 3y - [3x - 2y - \{0 - z + 2y\}]$$

$$= 2x - 3y - [3x - 2y + z - 2y]$$

$$= 2x - 3y - [3x + z - 4y]$$

$$= 2x - 3y - 3x - z + 4y$$

$$= (2x - 3x) + (-3y + 4y) - z$$

$$= -x + y - z$$

$$\underline{Q.13} \quad 5 + [x - \{2y - (6x + y - 4) + 2x\} - \{x - (y - 2)\}]$$

$$= 5 + [x - \{2y - 6x - y + 4 + 2x\} - \{x - y + 2\}]$$

$$= 5 + [x - \{(2y - y) + (-6x + 2x) + 4\} - \{x - y + 2\}]$$

$$= 5 + [x - \{y - 4x + 4 - x + y - 2\}]$$

$$= 5 + [x - y + 4x - 4 - x + y - 2]$$

$$= 5 + 4x - 6$$

$$= 4x - 1$$

$$\begin{aligned}
 \underline{14.} \quad & x^2 - [3x + \{2x - (x^2 - 1) + 2\}] \\
 &= x^2 - [3x + \{2x - x^2 + 1 + 2\}] \\
 &= x^2 - [3x + 2x - x^2 + 1 + 2] \\
 &= x^2 - [5x - x^2 + 3] = x^2 - 5x + x^2 - 3 \\
 &= 2x^2 - 5x - 3
 \end{aligned}$$

$$\begin{aligned}
 \underline{15.} \quad & 20 - [5xy + 3\{x^2 - (xy - y) - (x - y)\}] \\
 &= 20 - [5xy + 3\{x^2 - xy + y - x + y\}] \\
 &= 20 - [5xy + 3\{x^2 - xy + 2y - x\}] \\
 &= 20 - [5xy + 3x^2 - 3xy + 6y - 3x] \\
 &= 20 - [2xy + 3x^2 + 6y - 3x] \\
 &= 20 - 2xy - 3x^2 - 6y + 3x \\
 &= -3x^2 - 2xy - 6y + 3x + 20
 \end{aligned}$$

$$\begin{aligned}
 \underline{Q.16.} \quad & 85 - [12x - 7(8x - 3) - 2\{10x - 5(2 - 4x)\}] \\
 &= 85 - [12x - 56x + 21 - 2\{10x - 10 + 20x\}] \\
 &= 85 - [12x - 56x + 21 - 2\{30x - 10\}]
 \end{aligned}$$

$$= 85 - [12x - 56x + 21 - 60x + 20]$$

$$= 85 - [(12x - 56x - 60x) + (21 + 20)]$$

$$= 85 - [-104x + 41]$$

$$= 85 + 104x - 41 = 104x + 44$$

Q.17 $xy - [yz - zx - \{yx - (3y - xz) - (xy - zy)\}]$

$$= xy - [yz - zx - \{yx - 3y + xz - xy + zy\}]$$

$$= xy - [yz - zx - \{yx - 3y + xz + zy\}]$$

$$= xy - [yz - zx + 3y - xz - zy]$$

$$= xy - [(yz - zy) + (-zx - xz) + 3y]$$

$$= xy - [0 - 2zx + 3y]$$

$$= xy + 2zx - 3y$$