Algebraic Expressions
Exercise 6A

Q1

Answer :

(i)

5x + 7x + (-6x)

= 5x + 7x -6x

= 6x

(ii)

$\frac{3}{5}x + \frac{2}{3}x + \frac{-4}{5}x$

$= \frac{9x + 10x - 12x}{15} = \frac{7x}{15}$

(iii)

$5a^2b + (-8a^2b) + 7a^2b$

$= 5a^2b - 8a^2b + 7a^2b$

$4a^2b$

(iv)

$\frac{3}{4}x^2 + 5x^2 + \left(-3x^2\right) + \left(-\frac{1}{4}x^2\right)$

$= \frac{3}{4}x^2 - \frac{1}{4}x^2 + 5x^2 - 3x^2$

$= \frac{1}{2}x^2 + 2x^2 = \frac{5}{2}x^2$

(v)

$x - 3y + 4z + y - 2x - 8z + 5x - 2y - 3z$

= x- 2x + 5x - 3y + y - 2y + 4z - 8z - 3z

= 4x -4y -7z

(vi) Collecting like terms and adding them:

$2x^2 - 3y^2 + 5x^2 + 6y^2 + (-3x^2 - 4y^2)$

$= 2x^2 + 5x^2 - 3x^2 - 3y^2 + 6y^2 - 4y^2$

$= 4x^2 - y^2$

(vii) Collecting like terms and adding them:

$5x - 2x^2 - 8 + 8x^2 - 7x - 9 + 3 + 7x^2 - 2x$

(viii) Collecting like terms and adding them:

$$\frac{2}{3}a-\frac{4}{5}b+\frac{3}{5}c+\left(-\frac{3}{4}a-\frac{5}{2}b+\frac{2}{3}c\right)+\frac{5}{2}a+\frac{7}{4}b-\frac{5}{6}c$$

$$b-\frac{5}{2}b+\frac{7}{4}b+\frac{3}{5}c+\frac{2}{3}c-\frac{5}{6}c$$

$$=\frac{(8-9+30)a}{12}+\frac{(-16-50+35)b}{20}+\frac{(18+20-25)c}{30}$$

$$=\frac{29}{12}a-\frac{31}{20}b+\frac{13}{30}c$$

(ix) Collecting like terms and adding them:

$$\frac{8}{5}x+\frac{11}{7}y+\frac{9}{4}xy+\left(-\frac{3}{2}x-\frac{5}{3}y-\frac{9}{5}xy\right)$$

$$=\frac{8}{5}x-\frac{3}{2}x+\frac{11}{7}y-\frac{5}{3}y+\frac{9}{4}xy-\frac{9}{5}xy$$

$$=\frac{1}{10}x-\frac{2}{21}y+\frac{9}{20}xy$$

(x) Collecting like terms and adding them:

$$\frac{3}{2}x^3-\frac{1}{4}x^2+\frac{5}{3}+\left(-\frac{5}{4}x^3+\frac{3}{5}x^2-x+\frac{1}{5}\right)+\left(-x^2+\frac{3}{8}x-\frac{8}{15}\right)$$

$$=\frac{3}{2}x^3-\frac{5}{4}x^3-\frac{1}{4}x^2+\frac{3}{5}x^2-x^2-x+\frac{3}{8}x+\frac{5}{3}+\frac{1}{5}-\frac{8}{15}$$

$$=\frac{1}{4}x^3-\frac{13}{20}x^2-\frac{5}{8}x+\frac{4}{3}$$

Q2

Answer :

(i) 7xy- (-8xy)
= 7xy+ 8xy
= 15xy

(ii) - $3x^2$ - x^2
= $-4x^2$

(iii) (4y - 5x) - (x- y)
= 4y - 5x - x + y
= 5y - 6x

(iv) $(a^2 + b^2 + 2ab) - (a^2 + b^2 - 2ab)$

$a^2-a^2+b^2-b^2+2ab+2ab$ (Collecting like terms and adding them)

$= 4ab$

(v) $(2x^2 - 3y^2 + 6xy) - (x^2 - y^2)$

$2x^2-x^2-3y^2+y^2+6xy$ (Collecting like terms and adding them)

$=x^2-2y^2+6xy$

(vi) (2z -x -3y) - (x - y +3z)
= 2z -3z -x -x -3y +y (Collecting like terms and adding them)
= -z -2x - 2y

Q4

Answer :

$(8m - 7n + 6p^2) + (-3m - 4n - p^2)$

$= 8m - 3m - 7n - 4n + 6p^2 - p^2$

$= 5m - 11n + 5p^2$

$(2m + 4n - 3p^2) + (- m - n - p^2)$.

$= 2m - m + 4n - n - 3p^2 - p^2$

$= m + 3n - 4p^2$

Now, $(m + 3n - 4p^2) - (5m - 11n + 5p^2)$

$= -4m + 14n - 9p^2$

Q5

Answer :

$(8a - 6a^2 + 9) + (-10a - 8 + 8a^2)$

Collecting like terms and adding them:

$8a - 10a - 6a^2 + 8a^2 + 9 - 8$

$= -2a + 2a^2 + 1$

Now, $-3 - (-2a + 2a^2 + 1)$

$= 2a - 2a^2 - 4$

Q6

Answer :

Collecting like terms and adding them:

(i) 5x + 7x - 9y -y

= 12x -10y

(ii)

$x^2 - \frac{3}{2}x^2 - x - \frac{1}{2}x + \frac{3}{2}$

$= -\frac{1}{2}x^2 - \frac{3}{2}x + \frac{3}{2}$

(iii) 7 + 7 - 2x -x - 5x + 5y + y - 3y

= 14 - 8x -3y

(iv)

$\frac{1}{3}y^2 + \frac{2}{3}y^2 - 2y^2 - \frac{4}{7}y - \frac{2}{7}y - \frac{1}{7}y + 5 - 2 + 3$

$= -y^2 - y + 6$