Question:1

Add the following expressions:

i 5*x*, 7*x*, –6*x*

ii $\frac{3}{5}x, \frac{2}{3}x, \frac{-4}{5}x$

iii 5a^2b, –8a^2b, 7a^2b

iv $\frac{3}{4}x^2, 5x^2, -3x^2, -\frac{1}{4}x^2$

v *x* – 3*y* + 4*z*, *y* – 2*x* – 8*z*, 5*x* – 2*y* – 3*z*

vi 2x^2 – 3y^2, 5x^2 + 6y^2, – 3x^2 – 4y^2

vii 5*x* – 2x^2 – 8, 8x^2 – 7*x* – 9, 3 + 7x^2 – 2*x*

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

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

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

Solution:

i

5x + 7x + $-6x$

= 5x + 7x -6x

= 6x

ii

$\frac{3}{5}\mathrm{x} + \frac{2}{3}\mathrm{x} + \frac{-4}{5}\mathrm{x} = \frac{9\mathrm{x} + 10\mathrm{x} - 12\mathrm{x}}{15} = \frac{7\mathrm{x}}{15}$

iii

5a^2b +(–8a^2b) + 7a^2b

= 5a^2b – 8a^2b + 7a^2b

4a^2b

iv

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

v Collecting like terms and adding them:

x – 3*y* + 4*z* + *y* – 2*x* – 8*z* + 5*x* – 2*y* – 3*z*

= 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)

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

vii Collecting like terms and adding them:

5*x* – 2x^2 – 8 + 8x^2 – 7*x* – 9 + 3 + 7x^2 – 2*x*

$= -2\mathrm{x}^2 + 8\mathrm{x}^2 + 7\mathrm{x}^2 + 5\mathrm{x} - 7\mathrm{x} - 2\mathrm{x} - 8 - 9 + 3 = 13\mathrm{x}^2 - 4\mathrm{x} - 14$

viii Collecting like terms and adding them:

$\frac{2}{3}\mathrm{a} - \frac{4}{5}\mathrm{b} + \frac{3}{5}\mathrm{c} + \left(-\frac{3}{4}\mathrm{a} - \frac{5}{2}\mathrm{b} + \frac{2}{3}\mathrm{c}\right) + \frac{5}{2}\mathrm{a} + \frac{7}{4}\mathrm{b} - \frac{5}{6}\mathrm{c}\ \ \mathrm{b} - \frac{5}{2}\mathrm{b} + \frac{7}{4}\mathrm{b} + \frac{3}{5}\mathrm{c} + \frac{2}{3}\mathrm{c} - \frac{5}{6}\mathrm{c} = \frac{(8-9+30)\mathrm{a}}{12} + \frac{(-16-50+35)\mathrm{b}}{20} + \frac{(18+20-25)\mathrm{c}}{30} = \frac{29}{12}\mathrm{a} - \frac{31}{20}\mathrm{b} -$

ix Collecting like terms and adding them:

$\frac{8}{5}\mathrm{x} + \frac{11}{7}\mathrm{y} + \frac{9}{4}\mathrm{xy} + \left(-\frac{3}{2}\mathrm{x} - \frac{5}{3}\mathrm{y} - \frac{9}{5}\mathrm{xy}\right) = \frac{8}{5}\mathrm{x} - \frac{3}{2}\mathrm{x} + \frac{11}{7}\mathrm{y} - \frac{5}{3}\mathrm{y} + \frac{9}{4}\mathrm{xy} - \frac{9}{5}\mathrm{xy} = \frac{1}{10}\mathrm{x} - \frac{2}{21}\mathrm{y} + \frac{9}{20}\mathrm{xy}$

(x) Collecting like terms and adding them:

$\frac{3}{2}\mathrm{x}^3 - \frac{1}{4}\mathrm{x}^2 + \frac{5}{3} + \left(-\frac{5}{4}\mathrm{x}^3 + \frac{3}{5}\mathrm{x}^2 - \mathrm{x} + \frac{1}{5}\right) + \left(-\mathrm{x}^2 + \frac{3}{8}\mathrm{x} - \frac{8}{15}\right) = \frac{3}{2}\mathrm{x}^3 - \frac{5}{4}\mathrm{x}^3 - \frac{1}{4}\mathrm{x}^2 + \frac{3}{5}\mathrm{x}^2 - \mathrm{x}^2 - \mathrm{x} + \frac{3}{8}\mathrm{x} + \frac{5}{3} + \frac{1}{5} - \frac{8}{15} = \frac{1}{4}\mathrm{x}^3 - \frac{13}{20}\mathrm{x}^2 - \frac{5}{8}\mathrm{x} + \frac{4}{3}$

Question:2

Subtract:

i –8*xy* from 7*xy*

ii x^2 from – $3x^2$
iii $(x – y)$ from $(4y – 5x)$
iv $(a^2 + b^2 – 2ab)$ from $(a^2 + b^2 + 2ab)$
v $(x^2 – y^2)$ from $(2x^2 – 3y^2 + 6xy)$
vi $(x – y + 3z)$ from $(2z – x – 3y)$
Solution:
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 $(a^2 + b^2 + 2ab)$ - $(a^2 + b^2 – 2ab)$
= $a^2 - a^2 + b^2 - b^2 + 2ab + 2ab$ $Collectingliketermsandaddingthem$
= 4ab

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

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

Question:3
Subtract $(2a – 3b + 4c)$ from the sum of $(a + 3b – 4c)$, $(4a – b + 9c)$ and $(–2b + 3c – a)$.
Solution:
$(a + 3b – 4c) + (4a – b + 9c) + (–2b + 3c – a)$
= a + 4a - a + 3b -b -2b -4c +9c + 3c
= 4a + 8c

Now, 4a + 8c - $(2a – 3b + 4c)$
= 4a - 2a + 3b + 8c - 4c
= 2a + 3b + 4c

Question:4
Subtract the sum of $(8m – 7n + 6p^2)$ and $(–3m – 4n – p^2)$ from the sum of $(2m + 4n – 3p^2)$ and $(– m – n – p^2)$.
Solution:
$(8m – 7n + 6p^2) + (–3m – 4n – p^2)$

$(2m + 4n – 3p^2) + (– m – n – p^2)$.

Question:5
Subtract the sum of $(8a – 6a^2 + 9)$ and $(–10a – 8 + 8a^2)$ from –3.
Solution:
$(8a – 6a^2 + 9) + (–10a – 8 + 8a^2)$

Collecting like terms and adding them:

Question:6
Simplify:

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

ii

iii $[7 - 2x + 5y - (x - y)] - (5x + 3y - 7)$

iv

Solution:

Collecting like terms and adding them:

i 5x + 7x - 9y -y

= 12x -10y

ii

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

= 14 - 8x -3y

iv

Question:7

Find the products:

$3a^2 \times 8a^4$

Solution:

$3a^2 \times 8a^4$

Question:8

Find the products:

$-6x^3 \times 5x^2$

Solution:

$-6x^3 \times 5x^2$

Question:9

Find the products:

$(-4ab) \times (-3a^2bc)$

Solution:

$(-4ab) \times (-3a^2bc)$

Question:10

Find the products:

$(2a^2b^3) \times (-3a^3b)$

Solution:

$(2a^2b^3) \times (-3a^3b)$

Question:11

Find the products:

Solution:

Question:12

Find the products:

Solution:

Question:13
Find the products:

Solution:

Question:14
Find the products:

Solution:

Question:15
Find the products:

Solution:

Question:16
Find the products:

Solution:

Question:17
Find the products:

Solution:

Question:18
Find the products:

$(2a^2b) \times (-5ab^2c) \times (-6bc^2)$
Solution:

Question:19
Find the products:

$(-4x^2) \times (-6xy^2) \times (-3y)$
Solution:

Question:20
Find the products:

Solution:

Question:21
Find the products:

Solution:

Question:22
Find the products:

$(ab^2) \times (-b^2c) \times (-a^2c^3) \times (-3abc)$
Solution:

Question:23
Find the products:

Solution:

Question:24

Multiply and verify your result for $a = 2$ and $b = 3$.

Solution:

When a =2 and b =3, we get:

L.H.S. = R.H.S.

Hence, the result is verified.

Question:25

Multiply and verify your result for $x = 3$ and $y = 2$.

Solution:

Question:26

Find the value of $(2.3a^5b^2) \times (1.2a^2b^2)$, when $a = 1$ and $b = 0.5$.

Solution:

Question:27

Find the value of $(-8u^2v^6) \times (-20uv)$ for $u = 2.5$ and $v = 1$.

Solution:

Question:28

Find the product and verify the result for $a = 1$, $b = 2$ and $c = 3$.

Solution:

Question:29

Find the product and verify the result for $a = 1$, $b = 2$ and $c = 3$.

Solution:

Question:30

Find the product and verify the result for $a = 1$, $b = 2$ and $c = 3$.

Solution:

Question:31

Find the product and verify the result for $a = 1$, $b = 2$ and $c = 3$.

Solution:

Question:32

Find the product:

$4a(3a + 7b)$

Solution:

Question:33
Find the product:

$5a(6a - 3b)$
Solution:

Question:34
Find the product:

$8a^2(2a + 5b)$
Solution:

Question:35
Find the product:

$9x^2(5x + 7)$
Solution:

Question:36
Find the product:

$ab(a^2 - b^2)$
Solution:

Question:37
Find the product:

$2x^2(3x - 4x^2)$
Solution:

Question:38
Find the product:

Solution:

Question:39
Find the product:

$-17x^2(3x - 4)$
Solution:

Question:40
Find the product:

Solution:

Question:41
Find the product:

$-4x^2y(3x^2 - 5y)$
Solution:

Question:42
Find the product:

Solution:

Question:43
Find the product:

$9t^2(t + 7t^3)$
Solution:

Question:44
Find the product:

$10a^2(0.1a - 0.5b)$
Solution:

Question:45
Find the product:

$1.5a(10a^2 - 100ab^2)$
Solution:

Question:46
Find the product:

Solution:

Question:47
Find the product $24x^2(1-2x)$ and evaluate it for $x = 2$.
Solution:

Question:48
Find the product $ab(a^2+b^2)$ and evaluate it for $a = 2$ and $b =$.
Solution:

Question:49
Find the product $s\ (s^2 - st)$ and find its value for $s = 2$ and $t = 3$.
Solution:

Question:50
Find the product $-3y(xy + y^2)$ and find its value for $x = 4$ and $y = 5$.
Solution:

Question:51
Simplify

$a(b - c) + b(c - a) + c(a - b)$
Solution:

Question:52
Simplify

$a(b - c) - b(c - a) - c(a - b)$
Solution:

Question:53
Simplify

$3x^2 + 2(x + 2) - 3x(2x + 1)$
Solution:

Question:54
Simplify

$x(x + 4) + 3x(2x^2 - 1) + 4x^2 + 4$
Solution:

Question:55
Simplify

$2x^2 + 3x(1 - 2x^3) + x(x + 1)$
Solution:

Question:56
Simplify

$a^2b(a - b^2) + ab^2(4ab - 2a^2) - a^3b(1 - 2b)$
Solution:

Question:57
Simplify

$4st(s - t) - 6s^2(t - t^2) - 3t^2(2s^2 - s) + 2st(s - t)$
Solution:

Question:58
Find the product:

$(5x + 7)(3x + 4)$
Solution:

Question:59
Find the product:

$(4x - 3)(2x + 5)$
Solution:

Question:60
Find the product:

$(x - 6)(4x + 9)$
Solution:

Question:61
Find the product:

$(5y - 1)(3y - 8)$
Solution:

Question:62
Find the product:

$(7x + 2y)(x + 4y)$
Solution:

Question:63
Find the product:

$(9x + 5y)(4x + 3y)$
Solution:

Question:64
Find the product:

$(3m - 4n)(2m - 3n)$
Solution:

Question:65
Find the product:

$(0.8x - 0.5y)(1.5x - 3y)$
Solution:

Question:66
Find the product:

Solution:

Question:67
Find the product:

Solution:

Question:68
Find the product:

Solution:

Question:69
Find the product:

$(x^2 - a^2)(x - a)$
Solution:

Question:70
Find the product:

$(3p^2 + q^2)(2p^2 - 3q^2)$
Solution:

Question:71
Find the product:

$(2x^2 - 5y^2)(x^2 + 3y^2)$
Solution:

Question:72
Find the product:

$(x^3 - y^3)(x^2 + y^2)$
Solution:

Question:73
Find the product:

$(x^4 + y^4)(x^2 - y^2)$
Solution:

Question:74
Find the product:

Solution:

Question:75
Find the product:

$(x^2 - y^2)(x + 2y)$
Solution:

Question:76
Find the product:

$(2x + 3y - 5)(x + y)$
Solution:

Question:77
Find the product:

$(3x + 2y - 4)(x - y)$
Solution:
By column method:

Question:78
Find the product:

$(x^2 - 3x + 7)(2x + 3)$
Solution:
By column method:

Question:79
Find the product:

$(3x^2 + 5x - 9)(3x - 9)$
Solution:
By column method:

Question:80
Find the product:

$(9x^2 - x + 15)(x^2 - 3)$
Solution:
By column method:

Question:81
Find the product:

$(x^2 + xy + y^2)(x - y)$
Solution:
By column method:

Question:82
Find the product:

$(x^2 - xy + y^2)(x + y)$
Solution:
By column method:

Question:83
Find the product:

$(x^2 - 5x + 8)(x^2 + 2)$
Solution:
By column method:

Question:84
Simplify

$(3x + 4)(2x - 3) + (5x - 4)(x + 2)$
Solution:
3x +42x -3

$\therefore (3x + 4)(2x - 3) + (5x - 4)(x + 2)$

Question:85
Simplify

$(5x - 3)(x + 4) - (2x + 5)(3x - 4)$
Solution:
5x-3x+4

2x +53x-4

$\therefore$ 5x – 3$(x + 4) - (2x + 5)(3x - 4)$

Question:86
Simplify

$(9x - 7)(2x - 5) - (3x - 8)(5x - 3)$

Solution:

Question:87
Simplify

$(2x + 5y)(3x + 4y) – (7x + 3y)(2x – y)$
Solution:
2x +5y3x+4y

$\therefore (2x + 5y)(3x + 4y) – (7x + 3y)(2x – y)$

Question:88
Simplify

$(3x^2 + 5x – 7)(x – 1) – (x^2 – 2x + 3)(x + 4)$
Solution:
$(3x^2 + 5x – 7)(x – 1)$

By column method:

$(x^2 – 2x + 3)(x + 4)$

By column method:

$(3x^2 + 5x – 7)(x – 1) – (x^2 – 2x + 3)(x + 4)$