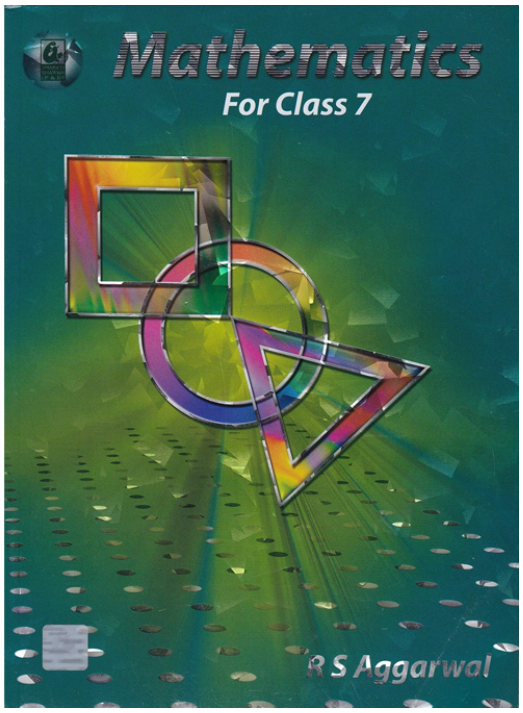
RS Aggarwal Solutions for Class 7 Maths Chapter 6–Algebraic Expressions

Class 7 - Chapter 6 Algebraic Expressions



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RS Aggarwal Solutions for Class 7 Maths Chapter 6–Algebraic Expressions

Class 7: Maths Chapter 6 solutions. Complete Class 7 Maths Chapter 6 Notes.

RS Aggarwal Solutions for Class 7 Maths Chapter 6–Algebraic Expressions

RS Aggarwal 7th Maths Chapter 6, Class 7 Maths Chapter 6 solutions

Ex 6A

Question 1.

Solution:

(*i*) $5x + 7x + (-6x)$

$= 5x + 7x - 6x = 12x - 6x = 6x$

(*ii*) $\frac{3}{5}x, \frac{2}{3}x, \left(\frac{-4}{5}x\right) = \frac{3}{5}x + \frac{2}{3}x + \frac{-4}{5}x$

$= \frac{9x + 10x - 12x}{15}$ (LCM of 5, 3 = 15)

$= \frac{19x - 12x}{15} = \frac{7}{15}x$

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

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

$= 12a^2b - 8a^2b = 4a^2b$

(*vii*) $(5x - 2x^2 - 8) + (8x^2 - 7x - 9) + (3 + 7x^2 - 2x)$

$= (-2x^2 + 5x - 8) + (8x^2 - 7x - 9) + (7x^2 - 2x + 3)$

$= 13x^2 - 4x - 14$

$-2x^2 + 5x - 8$

$8x^2 - 7x - 9$

$7x^2 - 2x + 3$

$13x^2 - 4x - 14$

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

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

$= \frac{3x^2 + 20x^2 - 12x^2 - x^2}{4}$ (LCM = 4)

$= \frac{23x^2 - 13x^2}{4} = \frac{10x^2}{4} = \frac{5}{2}x^2$

(*v*) $(x - 3y + 4z) + (y - 2x - 8z) + (5x - 2y - 3z) = 4x - 4y - 7z$

$x - 3y + 4z$

$-2x + y - 8z$

$5x - 2y - 3z$

$4x - 4y - 7z$

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

$2x^2 - 3y^2$

$+ 5x^2 + 6y^2$

$- 3x^2 - 4y^2$

$4x^2 - y^2$

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

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

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

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

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

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

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

$=\frac{16-15}{10}x+\frac{33-35}{21}y+\frac{45-36}{20}xy=\frac{1}{10}x+\left(\frac{-2}{21}\right)y+\frac{9}{20}xy$

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

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

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

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

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

$=\frac{6-5}{4}x^3+\frac{-5+12-20}{20}x^2+\frac{-8+3}{8}x+\frac{25+3-8}{15}$

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

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

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

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

Question 2.

Solution:

(*i*) $-8xy$ from $7xy$

$= 7xy - 8xy = (7 - 8)\,xy$

$= -xy$

(*ii*) x^2 from $-3x^2 = -3x^2 - x^2$

$= -4x^2$.

(*iii*) $(x - y)$ from $(4y - 5x)$

$= (4y - 5x) - (x - y) = 4y - 5x - x + y$

$= 4y + y - 5x - x = 5y - 6x$

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

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

$= a^2 + b^2 + 2ab - a^2 - b^2 + 2ab$

$= a^2 - a^2 + b^2 - b^2 + 2ab + 2ab$

$= 4ab$

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

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

$= 2x^2 - 3y^2 + 6xy - x^2 + y^2$

$= 2x^2 - x^2 - 3y^2 + y^2 + 6xy$

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

(*vi*) $(x - y + 3z)$ from $(2z - x - 3y)$

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

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

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

$= -2x - 2y - z$.

Question 3.

Solution:

Sum of (a + 3b – 4c), (4a – b + 9c) and (-2b + 3c – a)

$$\begin{array}{r} a + 3b - 4c \\ 4a - b + 9c \\ -a - 2b + 3c \\ \hline 4a \quad + 8c \\ \hline \end{array}$$

Now subtract (2a – 3b + 4c) from 4a + 8c

= 4a + 8c – (2a – 3b + 4c)

= 4a + 8c – 2a + 3b – 4c

= 4a – 2a + 3b + 8c – 4c

= 2a + 3b + 4c

Question 4.

Solution:

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

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

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

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

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

Sum of $(2m + 4n - 3p^2)$ and $(-m - n - p^2)$

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

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

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

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

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

$= m + 3n - 4p^2 - 5m + 11n - 5p^2$

$= m - 5m + 3n + 11n - 4p^2 - 5p^2$

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

Question 5.

Solution:

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

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

= 8a – 10a – 6a² + 8a² + 9 – 8

= -2a + 2a² + 1

Now -3 – (-2a + 2a² + 1)

= (-3 + 2a – 2a² – 1)

= -4 + 2a – 2a²

Question 6.

Solution:

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

$= 5x - 9y + 7x - y$

$= 5x + 7x - 9y - y = 12x - 10y$

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

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

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

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

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

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

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

$= (7 - 2x + 5y - x + y) - (5x + 3y - 7)$

$= 7 - 2x + 5y - x + y - 5x - 3y + 7$

$= 7 + 7 - 2x - x - 5x + 5y + y - 3y$

$= 14 - 8x + 3y$

$(iv)\ \left(\frac{1}{3}y^2 - \frac{4}{7}y + 5\right) - \left(\frac{2}{7}y - \frac{2}{3}y^2 + 2\right) - \left(\frac{1}{7}y - 3 + 2y^2\right)$

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

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

$= \left(\frac{1}{3} + \frac{2}{3} - 2\right)y^2 + \left(\frac{-4}{7}y - \frac{2}{7}y - \frac{1}{7}y\right) + 8 - 2$

$= \frac{1+2-6}{3}y^2 + \frac{-4-2-1}{7}y + 6$

$= \frac{-3}{3}y^2 + \frac{-7}{7}y + 6 = -y^2 - y + 6$

Ex 6B

Find the products:

Question 1.

Solution:

3 x 8 a^{2+4} = $24a^6$

Question 2.

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Solution:

$(-6x^3) \times (5x^2) = -6 \times 5x^{2+3} = -30x^5$

Question 3.

Solution:

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

$= (-4) \times (-3)\ a.\ a^2.b.\ b.\ c$

$= 12.a^{2+1}.\ b^{1+1}.c$

$= 12a^3b^2c$

Question 4.

Solution:

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

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

$= -6a^{2+3}.b^{3+1}$

$= -6a^5.b^4$

Question 5.

Solution:

$$\frac{2}{3}x^2y \times \frac{3}{5}xy^2 = \frac{2}{3} \times \frac{3}{5}\ x^2\ .\ x\ .\ y\ .\ y^2$$

$$= \frac{2}{5}\ .x^{2+1}.y^{1+2} = \frac{2}{5}\ .x^3.y^3$$

Question 6.

Solution:

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$$\left(\frac{-3}{4}ab^3\right)\times\left(\frac{-2}{3}a^2b^4\right)$$

$$=\frac{-3}{4}\times\frac{-2}{3}\ a\ .\ a^2.\ b^3\ .\ b^4$$

$$=\frac{1}{2}\ a^{1+2}.b^{3+4}=\frac{1}{2}\ a^3.b^7\ .$$

Question 7.

Solution:

$$\left(\frac{-1}{27}a^2b^2\right)\times\left(\frac{-9}{2}a^3bc^2\right)$$

$$=\frac{-1}{27}\times\left(\frac{-9}{2}\right)\ a^2\ .\ a^3\ .\ b^2\ .\ b\ .\ c^2$$

$$=\frac{1}{3\times2}\ a^{2+3}.b^{2+1}.c^2=\frac{1}{6}\ a^5.b^3.c^2\ .$$

Question 8.

Solution:

$$\left(\frac{-13}{5}ab^2c\right)\times\left(\frac{7}{3}a^2bc^2\right)$$

$$=\frac{-13}{5}\times\frac{7}{3}\ a\ .\ a^2\ .\ b^2\ .\ b\ .\ c\ .\ c^2$$

$$=\frac{-91}{15}a^{1+2}.b^{2+1}.c^{1+2}$$

$$=\frac{-91}{15}\ a^3.b^3.c^3$$

Question 9.

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Solution:

$$\left(\frac{-18}{5}x^2z\right)\times\left(\frac{-25}{6}xz^2y\right)$$

$$=\frac{-18}{5}\times\frac{-25}{6}x^2\,x\,.\,z^1\,.\,z^2\,.\,y$$

$$=[-3\times(-5)]\,.x^{2+1}.z^{1+2}.y=15\,x^3.y.z^3$$

Question 10.

Solution:

$$\left(\frac{-3}{14}xy^4\right)\times\left(\frac{7}{6}x^3y\right)$$

$$=\frac{-3}{14}\times\frac{7}{6}\,x\,.\,x^3\,.\,y^4\,.\,y$$

$$=\frac{-1}{4}\,x^{1+3}.y^{4+1}=\frac{-1}{4}\,x^4.y^5$$

Question 11.

Solution:

$$\left(\frac{-7}{5}x^2y\right)\times\left(\frac{3}{2}xy^2\right)\times\left(\frac{-6}{5}x^3y^3\right)$$

$$=\frac{-7}{5}\times\frac{3}{2}\times\frac{-6}{5}\,x^2\,.\,x\,.\,x^3\,.\,y\,.\,y^2\,.\,y^3$$

$$=\frac{63}{25}\,x^{2+1+3}.y^{1+2+3}$$

$$=\frac{63}{25}\,x^6.y^6$$

Question 12.

Solution:

$$(2a^2b) \times (-5ab^2c) \times (-6bc^2)$$
$$= 2 \times (-5) \times (-6)\, a^2 . a . b . b^2 . b . c . c^2$$
$$= 60 .a^{2+1}.b^{1+2+1}.c^{1+2} = 60 .a^3.b^4.c^3$$

Question 13.

Solution:

$$(-4x^2) \times (-6xy^2) \times (-3y)$$
$$= (-4) \times (-6) \times (-3)\, x^2 . x . y^2 . y$$
$$= -72\, x^{2+1}.y^{2+1}$$
$$= -72\, x^3.y^3$$

Question 14.

Solution:

$$\left(\frac{-3}{5}s^2t\right) \times \left(\frac{15}{7}st^2u\right) \times \left(\frac{7}{9}su^2\right)$$

$$= \frac{-3}{5} \times \frac{15}{7} \times \frac{7}{9}\, s^2 . s . s . t . t^2 . u . u^2$$
$$= -1\, s^{2+1+1}.t^{1+2}.u^{1+2} = -s^4.t^3.u^3$$

Question 15.

Solution:

$$\left(\frac{-2}{7}u^4v\right) \times \left(\frac{-14}{5}uv^3\right) \times \left(\frac{-3}{4}u^2v^3\right)$$

$$= \left(\frac{-2}{7}\right) \times \left(\frac{-14}{5}\right) \times \left(\frac{-3}{4}\right) u^4 .u .u^2.v. v^3.v^3 = \frac{-3}{5}.u^{4+1+2}.x^{1+3+3} = \frac{-3}{5}.u^7.v^7$$

Question 16.

Solution:

$$(ab^2) \times (-b^2c) \times (-a^2c^3) \times (-3abc)$$
$$= 1(ab^2) \times (-1)b^2c \times (-)a^2c^3 \times (-3)abc$$
$$= 1 \times (-1)(-1)(-3)\, a \,.\, a^2 \,.\, a \,.\, b^2 \,.\, b^2 \,.\, b \,.$$
$$c \,.\, c^3 \,.\, c$$
$$= -3.a^{1+2+1}.b^{2+2+1}.c^{1+3+1} = -3a^4.b^5.c^5$$

Question 17.

Solution:

$$\left(\frac{4}{3}x^2yz\right) \times \left(\frac{1}{3}y^2zx\right) \times (-6xyz^2)$$

$$= \frac{4}{3} \times \frac{1}{3} \times (-6) \,.\, x^2 \,.\, x \,.\, x \,.\, y \,.\, y^2 \,.\, y \,.\, z \,.\, z \,.\, z^2$$

$$= \frac{-8}{3} \,.\, x^{2+1+1}.y^{1+2+1}.\, z^{1+1+2}$$

$$= \frac{-8}{3} \,.x^4.y^4.z^4$$

Question 18.

Solution:

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$$= \frac{-2}{3} \times 4 \times 3$$

$$= -8$$

$$\frac{6}{5}a^3b^2 = \frac{6}{5} \times (2)^3 \times (3)^2$$

$$= \frac{6}{5} \times 2 \times 2 \times 2 \times 3 \times 3$$

$$= \frac{6}{5} \times 8 \times 9 = \frac{432}{5}$$

$$\therefore \text{ L.H.S.} = -8 \times \frac{432}{5} = \frac{-3456}{5}$$

$$\frac{-2}{3}a^2b \times \frac{6}{5}a^3b^2$$

$$= \frac{-2}{3} \times \frac{6}{5}\, a^2 \cdot a^3 \cdot b \cdot b^2$$

$$= \frac{-4}{5}\, a^{2+3}b^{1+2} = \frac{-4}{5}a^5b^3$$

Verification :

Now if $a = 2$, $b = 3$, then

$$-\frac{2}{3}a^2b = \frac{-2}{3} \times (2)^2 \times 3$$

$$\text{R.H.S.} = \frac{-4}{5}a^5b^3 = \frac{-4}{5}(2)^5(3)^3$$

$$= \frac{-4}{5}(2 \times 2 \times 2 \times 2 \times 2) \times 3 \times 3 \times 3$$

$$= \frac{-4}{5} \times 32 \times 27 = \frac{-4 \times 864}{5} = \frac{-3456}{5}$$

$$\therefore \frac{-3456}{5} = \frac{-3456}{5}$$

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

Question 19.

Solution:

$$-\frac{8}{21}x^2y^3 \times \frac{-7}{16}xy^2$$

$$= \frac{-8}{21} \times \frac{-7}{16}\ x^2 \cdot x \cdot y^3 \cdot y^2$$

$$= \frac{-1}{3} \times \frac{-1}{2} \cdot x^{2+1} \cdot y^{3+2} = \frac{1}{6}\ x^3 \cdot y^5$$

Verfication : $x = 3, y = 2$

$$\text{L.H.S.} = -\frac{8}{21}x^2y^3 \times \frac{-7}{16}xy^2$$

$$= \frac{-8}{21}(3)^2(2)^3 \times \frac{-7}{16}(3)(2)^2$$

$$= \frac{-8}{21} \times 9 \times 8 \times \frac{-7}{16} \times 3 \times 4$$

$$= \frac{-8}{21} \times \frac{-7}{16} \times 9 \times 8 \times 3 \times 4$$

$$= \frac{-1}{3} \times \frac{-1}{2} \times 72 \times 12$$

$$= 12 \times 12 = 144$$

$$\text{R.H.S.} = \frac{1}{6}x^3y^5 = \frac{1}{6} \times (3)^3(2)^5$$

$$= \frac{1}{6} \times 27 \times 32 = 9 \times 16 = 144$$

$\therefore$ L.H.S. = R.H.S.

Question 20.

Solution:

$$2.3a^5b^2 \times 1.2a^2b^2$$

$$= 2.3 \times 1.2\ a^{5+2}.b^{2+2} = 2.76\ a^7b^4$$

$$= 2.76 \times (1)^7 \times (0.5)^4$$

$$= 2.76 \times (1)^7 \times \left(\frac{1}{2}\right)^4 = 2.76 \times 1 \times \frac{1}{16} = \frac{2.76}{16}$$

$$= 0.1735$$

Question 21.

Solution:

$$(-8u^2v^6) \times (-20uv)$$
$$= (-8) \times (-20)\, u^{2+1}.v^{6+1}$$
$$= 160u^3v^7$$
$$= 160(2.5)^3(1)^7$$
$$= 160 \times \left(\frac{5}{2}\right)^3 \times (1)^7$$
$$= 160 \times \frac{5}{2} \times \frac{5}{2} \times \frac{5}{2} \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1$$
$$= 2500$$

Find the products given below and in each case verify the result for a = 1, b = 2 and c = 3 :

Question 22.

Solution:

$$\left(\frac{2}{5}a^2b\right)\times\left(-15b^2ac\right)\left(-\frac{1}{2}c^2\right)$$

$$= \frac{2}{5}\times(-15)\times\left(-\frac{1}{2}\right)\ a^2.a.b.b^2.c.c^2$$

$$= 3a^{2+1}.b^{1+2}.c^{1+2} = 3a^3b^3c^3$$

Verification

$$= \left(\frac{2}{5}a^2b\right)\times\left(-15b^2ac\right)\left(-\frac{1}{2}c^2\right)$$

$$= \frac{2}{5}(1)^2(2)\times(-15)\times(2)^2\times1\times3)\times\left(-\frac{1}{2}(3)^2\right)$$

$$= \left(\frac{2}{5}\times1\times2\right)\times(-15\times4\times3)\times\left(-\frac{1}{2}\times9\right)$$

$$= \frac{4}{5}\times(-180)\times\left(-\frac{9}{2}\right) = \frac{360\times9}{5} = 72\times9$$

$$= 648$$

$$\text{R.H.S.} = 3a^3b^3c^3 = 3(1)^3(2)^3(3)^3$$

$$= 3\times1\times8\times27$$

$$= 81\times8 = 648$$

$$\therefore \text{L.H.S.} = \text{R.H.S.}$$

Question 23.

Solution:

$$= \frac{1}{4} \times (-6) \times \left(-\frac{1}{3}\right) a.b.b^2.c.c.c^3$$

$$= \frac{1}{2}\ a.b^{1+2}.c^{1+1+3}$$

$$= \frac{1}{2}\ ab^3c^5$$

Verification

$$\text{L.H.S.} = \left(\frac{1}{4}abc\right) \times \left(-6b^2c\right)\left(-\frac{1}{3}c^3\right)$$

$$= \left[\frac{1}{4}(1)(2)(3)\right] \times \left[-6(2)^2 \times 3\right]\left[-\frac{1}{3}(3)^3\right]$$

$$= \left(\frac{3}{2}\right) \times (-72) \times (-9)$$

$$= \frac{3 \times 648}{2} = 3 \times 324$$

$$\therefore \left(\frac{1}{4}abc\right) \times \left(-6b^2c\right)\left(-\frac{1}{3}c^3\right) = 972$$

$$\text{R.H.S.} = \frac{1}{2}\ ab^3c^5 = \frac{1}{2} \times 1 \times (2)^3 \times (3)^5$$

$$= \frac{1}{2} \times 8 \times 243$$

$$= 4 \times 243 = 972$$

$$\therefore \text{ L.H.S.} = \text{R.H.S.}$$

Question 24.

Solution:

$$= \frac{96}{5}a^4b^6c^4$$

Verfication :

$$\text{L.H.S.} = \left(\frac{4}{9}abc^3\right)\times\left(\frac{-27}{5}a^3b^2\right)\times\left(-8b^3c\right)$$

$$= \left[\frac{4}{9}\times 1\times 2\times (3)^3\right]\times\left[\frac{-27}{5}(1)^3(2)^2\right]$$

$$\times\left[-8\times(2)^3\times 3\right]$$

$$= \left[\frac{4}{9}\times 1\times 2\times 27\right]\times\left[\frac{-27}{5}1\times 4\right]\times\left[-8\times 8\times 3\right]$$

$$= (24)\times\left(\frac{-108}{5}\right)\times(-192) = \frac{497664}{5}$$

$$\left(\frac{4}{9}abc^3\right)\times\left(\frac{-27}{5}a^3b^2\right)\times\left(-8b^3c\right)$$

$$= \frac{4}{9}\times\left(\frac{-27}{5}\right)(-8)\ a.a^3.b.b^2.b^3.c^3.c$$

$$\text{R.H.S.} = \frac{96}{5}(a^4b^6c^4) = \frac{96}{5}(1)^4(2)^6(3)^4$$

$$= \frac{96}{5}\times 1\times 64\times 81 = \frac{497664}{5}$$

$\therefore$ L.H.S. = R.H.S.

Question 25.

Solution:

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

$$=\left(\frac{-4}{7}\right)\times\left(\frac{-2}{3}\right)\times\left(\frac{-7}{6}\right)a^2.a.b.b^2.c.c^2$$

$$=\frac{-4}{9}a^3b^3c^3$$

Verification :

L.H.S.

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

$$\left[\frac{-4}{7}(1)^2(2)\right]\times\left[\frac{-2}{3}(2)^2\times3\right]\times\left[\frac{-7}{6}(3)^2\times1\right]$$

$$=\left[\frac{-4}{7}\times1\times2\right]\times\left[\frac{-2}{3}\times4\times3\right]\times\left[\frac{-7}{6}\times9\right]$$

$$=\left(\frac{-8}{7}\right)\times(-8)\times\left(-\frac{21}{2}\right)$$

$$=-\left[\frac{8}{7}\times8\times\frac{21}{2}\right]$$

$$=-96$$

$$\text{R.H.S.}=\frac{-4}{9}a^3b^3c^3=\frac{-4}{9}(1)^3\times(2)^3\times(3)^3$$

$$=\frac{-4}{9}\times1\times8\times27=-96$$

$\therefore$ L.H.S. = R.H.S.

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Find each of the following products:

Question 1.

Solution:

$4a(3a + 7b) = 4a \times 3a + 4a \times 7b = 12a^2 + 28ab$

Question 2.

Solution:

$5a(6a – 3b) = 5a \times 6a – 5a \times 3b = 30a^2 – 15ab$

Question 3.

Solution:

$8a^2 (2a + 5b) = 8a^2 \times 2a + 8a^2 \times 5b = 16a^3 + 40a^2b$

Question 4.

Solution:

$9x^2 (5x + 7) = 9x^2 \times 5x + 9x^2 \times 7 = 45x^3 + 63x^2$

Question 5.

Solution:

$ab(a^2 – b^2) = ab \times a^2 – ab \times b^2 = a^3b – ab^3$

Question 6.

Solution:

$2x^2 (3x – 4x^2) = 2x^2 \times 3x – 2x^2 \times 4x^2 = 6x^3 – 8x^4$

Question 7.

Solution:

$$\frac{3}{5}m^2n\,(m+5n)$$

$$=\frac{3}{5}m^2n\times m+\frac{3}{5}m^2n\times 5n$$

$$=\frac{3}{5}m^3n+3m^2n^2$$

Question 8.

Solution:

$-1\ 7x^2\ (3x - 4) = -17x^2 \times 3x - 17x^2 \times (-4) = -51x^3 + 68x^2$

$$\frac{7}{2}x^2\left(\frac{4}{7}x+2\right)$$

$$=\frac{7}{2}x^2\times\frac{4}{7}x+\frac{7}{2}x^2\times 2$$

$$=2x^3+7x^2$$

Question 9.

Solution:

$$\frac{7}{2}x^2\left(\frac{4}{7}x+2\right)$$

$$=\frac{7}{2}x^2\times\frac{4}{7}x+\frac{7}{2}x^2\times 2$$

$$=2x^3+7x^2$$

Question 10.

Solution:

$-4x^2y\ (3x^2 - 5y)$

$= -4x^2\,y \times 3x^2 - 4x^2\,y \times (-5y)$

$= -12x^2\,y + 20x^2\,y^2$

Question 11.

Solution:

$$\frac{-4}{27}xyz\left(\frac{9}{2}x^2yz - \frac{3}{4}xyz^2\right)$$

$$= \frac{-4}{27}xyz \times \frac{9}{2}x^2yz - \left\{-\frac{4}{27}xyz \times \left(-\frac{3}{4}\right)xyz^2\right\}$$

$$= \frac{-2}{3}x^3y^2z^2 + \frac{1}{9}x^2y^2z^3$$

Question 12.

Solution:

$9t^2\ (t + 7t^3) = 9t^2 \times t + 9t^2 \times 7t^3 = 9t^3 + 63t^5$

Question 13.

Solution:

$$10a^2\,(0.1a - 0.5b)$$

$$= 10a^2 \times 0.1a - 10a^2 \times 0.5b$$

$$= 10a^2 \times \frac{1}{10}a - 10a^2 \times \frac{5}{10}\,b = a^3 - 5a^2b$$

Question 14.

Solution:

$$
\begin{aligned}
& 1.5a\,(10a^2b - 100ab^2) \\
&= 1.5a \times 10a^2b - 1.5a \times 100ab^2 \\
&= \frac{15}{10}a \times 10a^2b - \frac{15}{10}a \times 100ab^2 \\
&= 15a^3b - 150a^2b^2
\end{aligned}
$$

Question 15.

Solution:

$$
\begin{aligned}
& \frac{2}{3}abc\ (a^2 + b^2 - 3c^2) \\
&= \frac{2}{3}abc \times a^2 + \frac{2}{3}abc \times b^2 + \frac{2}{3}abc \times (-3c^2) \\
&= \frac{2}{3}a^3bc + \frac{2}{3}ab^3c - 2abc^3
\end{aligned}
$$

Question 16.

Solution:

$24x^2\ (1 - 2x)$

$= 24x^2 \text{ x } 1 - 24x^2 \text{ x } 2x$

$= 24x^2 - 48x^3$

If x = 2, then

$24x^2 - 48x^3$

$= 24(2)^2 - 48(2)^3$

= 24 x 4 – 48 x 8

= 96 – 384

= -288

Question 17.

Solution:

$$ab(a^2+b^2) = ab \times a^2 + ab \times b^2$$
$$= a^3b + ab^3$$

If $a = 2, b = \frac{1}{2}$, then

$$a^3b + ab^3 = (2)^3 \times \frac{1}{2} + 2 \times \left(\frac{1}{2}\right)^3$$

$$= 8 \times \frac{1}{2} + 2 \times \frac{1}{8}$$

$$= 4 + \frac{1}{4} = \frac{16+1}{4} = \frac{17}{4} = 4\frac{1}{4}$$

Question 18.

Solution:

$s(s^2 – st) = s \times s^2 – s \times st = s^3 – s^2t$

If s = 2, t = 3, then

$s^3 – s^2t = (2)^3 – (2)^2 \times 3 = 8 – 4 \times 3 = 8 – 12 = -4$

Question 19.

Solution:

$-3y\ (xy + y^2) = -3y \times xy + (-3y) \times y^2 = -3xy^2 - 3y^3$

if $x = 4, y = 5$, then

$-3xy^2 - 3y^3$

$= -3(4)(5)^2 - 3(5)^3 = -3 \times 4 \times 25 - 3 \times 125 = -300 - 375 = -675$

Simplify each of the following:

Question 20.

Solution:

$a(b - c) + b(c - a) + c(a - b) = ab - ac + bc - ab + ac - bc = 0$

Question 21.

Solution:

$a(b - c) - b(c - a) - c(a - b) = ab - ac - bc + ab - ac + bc = 2ab - 2ac$

Question 22.

Solution:

$3x^2 + 2(x + 2) - 3x\ (2x + 1)$

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

Question 23.

Solution:

$x\ (x + 4) + 3x\ (2x^2 - 1) + 4x^2 + 4$

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

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

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

Question 24.

Solution:

$2x^2 + 3x\ (1 - 2x^3) + x\ (x + 1)$

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

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

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

Question 25.

Solution:

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

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

$= a^3b - a^3b + 2a^3b^2 - a^2b^3 + 4a^26^3$

$= 3a^2b^3$

Question 26.

Solution:

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

$= 4s^2t - 4st^2 - 6s^2t + 6s^2t^2 - 6s^2t^2 + 3st^2 + 2s^2t - 2st^2$

$= 4s^2t - 6s^2t + 2s^2t - 4st^2 + 3st^2 - 2st^2 + 6s^2t^2 - 6s^2t^2$

$= 6s^2t - 6s^2t - 6st^2 + 3st^2 + 6s^2t^2 - 6s^2t^2$

$= -3st^2$

Ex 6D

Find each of the following products.

Question 1.

Solution:

(5x + 7) (3x + 4)

= 5x (3x + 4) + 7 (3x + 4)

= 5x x 3x + 5x x 4 + 7 x 3x + 7 x 4

= $15x^2$ + 20x + 21x + 28

= $15x^2$ + 41x + 28

Question 2.

Solution:

(4x – 3) (2x + 5)

= 4x (2x + 5) – 3 (2x + 5)

= 4x x 2x + 4x x 5 – 3 x 2x -3 x 5

= $8x^2$ + 20x – 6x – 15

= $8x^2$ + 14x – 15

Question 3.

Solution:

(x – 6) (4x + 9)

= x (4x + 9) – 6 (4x + 9)

= x x 4x + x x 9 – 6 x 4x – 6 x 9

= $4x^2$ + 9x – 24x – 54

= $4x^2$ – 15x – 54

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Question 4.

Solution:

$(5y – 1) (3y – 8)$

$= 5y \times 3y – 5y \times 8 – 1 \times 3y – 8 \times (-1)$

$= 15y^2 – 40y – 3y + 8$

$= 15y^2 – 43y + 8$

Question 5.

Solution:

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

$= 7x (x + 4y) + 2y (x + 4y)$

$= 7x \times x + 7x \times 4y + 2y \times x + 2y \times 4y$

$= 7x^2 + 28xy + 2xy + 8y^2$

$= 7x^2 + 30xy + 8y^2$

Question 6.

Solution:

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

$= 9x (4x + 3y) + 5y (4x + 3y)$

$= 9x \times 4x + 9x \times 3y + 5y \times 4x + 5y \times 3y$

$= 36x^2 + 27xy + 20xy + 15y^2$

$= 36x^2 + 47xy + 15y^2$

Question 7.

Solution:

(3m – 4n) (2m – 3n)

= 3m (2m – 3n) – 4n (2m – 3n)

= 3m x 2m – 3m x 3n – 4n x 2m – 4n x (-3n)

= $6m^2$ – 9mn – 8mn + $12n^2$

= $6m^2$ – 17mn + $12n^2$

Question 8.

Solution:

(0.8x – 0.5y) (1.5x – 3y)

= 0.8x (1.5x – 3y) – 0.5y (1.5x – 3y)

= 0.8x x 1.5x – 0.8x x 3y – 0.5y x 1.5x – 0.5y x (-3y)

= $1.20x^2$ – 2.4xy – 0.75xy + $1.5y^2$

= $1.2x^2$ – 3.15xy + $1.5y^2$

Question 9.

Solution:

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

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

$$=\frac{1}{5}x\times\frac{2}{3}x-\frac{1}{5}x\times y+2y\times\frac{2}{3}x-2y\times y$$

$$=\frac{2}{15}x^2-\frac{1}{5}xy+\frac{4}{3}xy-2y^2 \qquad =\frac{2}{15}x^2+xy\left(\frac{-3+20}{15}\right)-2y^2$$

$$=\frac{2}{15}x^2+xy\left(\frac{-1}{5}+\frac{4}{3}\right)-2y^2 \qquad =\frac{2}{15}x^2+\frac{17}{15}xy-2y^2$$

Question 10.

Solution:

$$\left(\frac{2}{5}x-\frac{1}{2}y\right)(10x-8y)$$

$$=\frac{2}{5}x(10x-8y)-\frac{1}{2}y(10x-8y)$$

$$=4x^2-\frac{16}{5}xy-5xy+4y^2$$

$$=4x^2-xy\left(\frac{16}{5}+5\right)+4y^2$$

$$=4x^2-xy\left(\frac{16+25}{5}\right)+4y^2$$

$$=4x^2-xy\times\frac{41}{5}xy+4y^2$$

$$=4x^2-\frac{41}{5}xy+4y^2$$

Question 11.

Solution:

$$=3a^2+ab\left(\frac{9}{4}+\frac{8}{3}\right)+2b^2$$

$$=3a^2+ab\left(\frac{27+32}{12}\right)+2b^2$$

$$=3a^2+ab\times\frac{59}{12}+2b^2$$

$$=3a^2+\frac{59}{12}ab+2b^2$$

$$=3a^2+ab\left(\frac{9}{4}+\frac{8}{3}\right)+2b^2$$

$$=3a^2+ab\left(\frac{27+32}{12}\right)+2b^2$$

$$=3a^2+ab\times\frac{59}{12}+2b^2$$

$$=3a^2+\frac{59}{12}ab+2b^2$$

Question 12.

Solution:

$(x^2 – a^2) (x – a)$

$= x^2 (x – a) – a^2 (x – a)$

$= x^2 \times x – x^2 \times a – a^2 \times x – a^2 (-a)$

$= x^3 – x^2 a – xa^2 + a^3$

Question 13.

Solution:

$(3p^2 + q^2) (2p^2 – 3q^2)$

$= 3p^2 (2p^2 – 3q^2) + q^2 (2p^2 – 3q^2)$

$= 3p^2 \times 2p^2 – 3p^2 \times 3q^2 + q^2 \times 2p^2 – q^2 \times 3q^2$

$= 6q^4 – 9p^2q^2 + 2p^2q^2 – 3q^4$

$= 6p^4 – 7p^2q^2 – 3q^4$

Question 14.

Solution:

$(2x^2 – 5y^2) (x^2 + 3y^2)$

$= 2x^2 (x^2 + 3y^2) – 5y^2 (x^2 + 3y^2)$

$= 2x^2 \times x^2 + 2x^2 \times 3y^2 – 5y^2 \times x^2 – 5y^2 \times 3y^2$

$= 2x^4 + 6x^2 y^2 – 5x^2 y^2 – 15y^4$

$= 2y^4 + x^2 y^2 – 15y^4$

Question 15.

Solution:

$(x^3 – y^3) (x^2 + y^2)$

$= x^3 (x^2 + y^2) – y^3 (x^2 + y^2)$

$= x^3 \times x^2 + x^3 \times y^2 – y^3 \times x^2 – y^3 \times y^2$

$= x^5 + x^3 y^2 – x^2 y^3 – y^5$

Question 16.

Solution:

$(x^4 + y^4) (x^2 – y^2)$

$= x^4 (x^2 – y^2) + y^4 (x^2 – y^2)$

$= x^4 \times x^2 – x^4 \times y^2 + y^4 \times x^2 – y^4 \times y^2$

$= x^6 – x^4 y^2 + x^2 y^4 – y^6$

Question 17.

Solution:

$$\left(x^4+\frac{1}{x^4}\right)\left(x+\frac{1}{x}\right)$$

$$= x^4\left(x+\frac{1}{x}\right)+\frac{1}{x^4}\left(x+\frac{1}{x}\right)$$

$$= x^4\times x+x^4\times\frac{1}{x}+\frac{1}{x^4}\times x+\frac{1}{x^4}\times\frac{1}{x}$$

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

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

Question 18.

Solution:

$(x^2 – y^2) (x + 2y)$

$= x^2 (x + 2y) – y^2 (x + 2y)$

$= x^2 \times x + x^2 \times 2y – y^2 \times x – y^2 \times 2y$

$= x^3 + 2x^2 y – xy^2 – 2y^3$

Question 19.

Solution:

$(2x + 3y – 5) (x + y)$

$= 2x (x + y) + 3y (x + y) – 5 (x + y)$

$= 2x \times x + 2x \times y + 3y \times x + 3y \times y – 5 \times x – 5 \times y$

$= 2x^2 + 2xy + 3xy + 3y^2 – 5x – 5y$

$= 2x^2 + 5xy + 3y^2 – 5x – 5y$

Question 20.

Solution:

$(3x + 2y – 4) (x – y)$

$= 3x (x – y) + 2y (x – y) – 4 (x – y)$

$= 3x \times x – 3x \times y + 2y \times x – 2y \times y – 4 \times x – 4 \times (-y)$

$= 3x^2 – 3xy + 2xy – 2y^2 – 4x + 4y$

$= 3x^2 – xy – 2y^2 – 4x + 4y$

Question 21.

Solution:

$(x^2 – 3x + 7) (2x + 3)$

$= x^2 (2x + 3) – 3x (2x + 3) + 7 (2x + 3)$

$= x^2 \times 2x + x^2 \times 3 – 3x \times 2x – 3x \times 3 + 7 \times 2x + 7 \times 3$

$= 2x^3 + 3x^2 – 6x^2 – 9x + 14x + 21$

$= 2x^3 – 3x^2 + 5x + 21$

Question 22.

Solution:

$(3x^2 + 5x – 9) (3x – 9)$

$= 3x^2 (3x – 9) + 5x (3x – 9) – 9 (3x – 9)$

$= 3x^2 \times 3x – 3 \times 2 \times 9 + 5x \times 3x + 5x \times (-9) – 9 \times 3x – 9 \times (-9)$

$= 9x^3 – 27x^2 + 15x^2 – 45x – 27x + 81$

$= 9x^3 – 12x^2 – 72x + 81$

Question 23.

Solution:

$(9x^2 – x + 15) (x^2 – 3)$

$= 9x^2 (x^2 – 3) – x (x^2 – 3) + 15 (x^2 – 3)$

$= 9x^2 \times x^2 – 9x^2 \times 3 – x \times x^2 + x \times 3 + 15 \times x^2 – 15 \times 3$

$= 9x^4 – 27x^2 – x^3 + 3x + 15x^2 – 45$

$= 9x^4 – x^3 – 12x^2 + 3x – 45$

Question 24.

Solution:

$(x^2 + xy + y^2)(x - y)$

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

$= x^2 \times x - x^2 \times y + xy \times x - xy \times y + y^2 \times x - y^2 \times y$

$= x^3 - x^2y + x^2y - xy^2 + xy^2 - y^2$

$= x^3 - y^3$

Question 25.

Solution:

$(x^2 - xy + y^2)(x + y)$

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

$= x^3 + x^2 y - x^2 y - xy^2 + xy^2 + y^3$

$= x^3 + y^3$

Question 26.

Solution:

$(x^2 - 5x + 8)(x^2 + 2)$

$= x^2 (x^2 + 2) - 5x (x^2 + 2) + 8 (x^2 + 2)$

$= x^2 \times x^2 + x^2 \times 2 - 5x \times x^2 - 5x \times 2 + 8 \times x^2 + 8 \times 2$

$= x^4 + 2x^2 - 5x^3 - 10x + 8x^2 + 16$

$= x^4 - 5x^3 + 2x^2 + 8x^2 - 10x + 16$

$= x^4 - 5x^3 + 10x^2 - 10x + 16$

Simplify:

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Question 27.

Solution:

$(3x + 4)(2x – 3) + (5x – 4)(x + 2)$

$= [3x(2x – 3) + 4(2x – 3)] + [5x(x + 2) – 4(x + 2)]$

$= [3x \times 2x – 3x \times 3 + 4 \times 2x – 4 \times 3] + [5x \times x + 5x \times 2 – 4 \times x – 4 \times 2]$

$= [6x^2 – 9x + 8x – 12] + [5x^2 + 10x – 4x – 8]$

$= (6x^2 – x – 12) + (5x^2 + 6x – 8)$

$= 6x^2 – x – 12 + 5x^2 + 6x – 8$

$= 6x^2 + 5x^2 – x + 6x – 12 – 8$

$= 11x^2 + 5x – 20$

Question 28.

Solution:

$(5x – 3)(x + 4) – (2x + 5)(3x – 4)$

$= [5x \times x + 5x \times 4 – 3 \times x – 3 \times 4] – [2x \times 3x + 2x \times (-4) + 5 \times 3x + 5x(-4)]$

$= [5x^2 + 20x – 3x – 12] – [6x^2 – 8x + 15x – 20]$

$= (5x^2 + 17x – 12) – (6x^2 + 7x – 20)$

$= 5x^2 + 17x – 12 – 6x^2 – 7x + 20$

$= 5x^2 – 6x^2 + 17x – 7x – 12 + 20$

$= -x^2 + 10x + 8$

Question 29.

Solution:

(9x – 7) (2x – 5) – (3x – 8) (5x – 3)

= [9x (2x – 5) -7 (2x – 5)] – [3x (5x – 3) -8 (5x – 3)]

= [9x x 2x – 9x x 5 – 7 x 2x – 7 x (-5)] – [3x x 5x – 3x x 3 – 8 x 5x – 8 x (-3)]

= [$18x^2$ – 45x – 14x + 35] – [$15x^2$ – 9x – 40x + 24]

= $18x^2$ – 45x – 14x + 35 – $15x^2$ + 9x + 40x – 24

= $18x^2$ – $15x^2$ – 45x – 14x + 9x + 40x + 35 – 24

= $3x^2$ – 59x + 49x + 11

= $3x^2$ – 10x + 11

Question 30.

Solution:

(2x + 5y) (3x + 4y) – (7x + 3y) (2x + y)

= [2x (3x + 4y) + 5y (3x + 4y)] – [7x (2x + y) + 3y (2x + y)]

= [2x x 3x + 2x x 4y + 5y x 3x + 5y x 4y] – [7x x 2x + 7x x y + 3y x 2x + 3y x y]

= [$6x^2$ + 8xy + 15xy + $20y^2$] – [$14x^2$ + 7xy + 6xy + $3y^2$]

= [$6x^2$ + 23xy + $20y^2$] – [$14x^2$ + 13xy + $3y^{2]}$

= $6x^2$ + 23xy + $20y^2$ – $14x^2$ – 13xy – $3y^2$

= $6x^2$ – $14x^2$ + 23xy – 13xy + $20y^2$ – $3y^2$

= -$8x^2$ + 10xy + $11y^2$

Question 31.

Solution:

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

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

= $[3x^2 \times x – 3x^2 \times 1 + 5x \times x – 5x \times (-1) – 7 \times x - 7 \times (-1)] -[x^2 \times x + x^2 \times 4 – 2x \times x – 2x \times 4 + 3 \times x + 3 \times 4]$

= $[3x^3 – 3x^2 + 5x^2 – 5x – 7x + 7] – [x^3 + 4x^2 – 2x^2 – 8x + 3x + 12]$

= $[3x^3 + 2x^2 – 12x + 7] – [x^3 + 2x^2 – 5x + 12]$

= $3x^3 + 2x^2 – 12x + 7 – x^3 – 2x^2 + 5x – 12$

= $3x^3 – x^3 + 2x^2 – 2x^2 – 12x + 5x – 12 + 7$

= $2x^3 – 7x – 5$

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