Ch–12 (Fundamental concepts and operations on Algebraic Expressions)

Exr – 12 (A)

1. ii) $7x \times y^2 \times z^3 = 7xy^2z^3 \rightarrow$ Monomial

iii) $\dfrac{9x^3}{2} \rightarrow$ Monomial

v) $\dfrac{a}{3} + \dfrac{b}{6} \rightarrow$ Binomial.

vii) $\dfrac{x^2 - 2y^2 + z^2}{3} = \dfrac{x^2}{3} - \dfrac{2y^2}{3} + \dfrac{z^2}{3} \rightarrow$ Trinomial.

2. ii) πr^2 Numerical co-efficient $= \pi \left(\dfrac{22}{7}\right)$

$= \dfrac{22}{7} r^2$ Literal   "   " $= r^2$ (Answer).

iii) $-\dfrac{3}{8} bcx$ Numerical co-efficient $= -\dfrac{3}{8}$

   Literal   " $-$ " $= bcx$ (Answer)

v) $5a^2 \times b \div 2c$

$= \dfrac{5a^2b}{2c}$ Numerical co-efficient $= \dfrac{5}{2}$

   Literal   "   " $= \dfrac{a^2b}{c}$ (Answer)

3. iii) In $-\dfrac{3}{5} x^3y^2z$ co-efficient of $\dfrac{3}{5}xyz = -x^2y$ (Answer)

iv) In $-\dfrac{3}{5} x^3y^2z$ "   "   " $-x^2y = \dfrac{3}{5}xyz$ (Answer)

4. ii) $6a^2bc, 6ab^2c \rightarrow$ They are not like terms.

vi) $3xy^2p, -8py^2x \rightarrow$ Like Terms.   (Answer)

5. iii) $z + \sqrt{z}$

$= z + (z)^{\frac{1}{2}}$ → Not a polynomial, as power of the variable is fraction.

iv) $x - \frac{1}{x}$

$= x - (x)^{-1}$ → Not a polynomial, as power of variable is negative number.

vi) $x^2 + y^2 + xy + x^2 y^2$ → It is a polynomial as power of all variables are positive integers.

ix) $x^2 + \sqrt{3}\, x + 5$ → It is a polynomial as power of all variables are positive integers.

xi) $6x^2 \sqrt{y} - 3xy + 5$

$= 6x^2 (y)^{\frac{1}{2}} - 3xy + 5$ → Not a polynomial as power of variable is fraction.

6. vii) $1 - y - y^2 + 3y^5$ → Highest power of y is 5
∴ Degree = 5.

viii) $x^2 - \frac{x}{2}$ → Highest power of x is 2.
∴ Degree = 2

ix) $t^4 - t^3 + 2t - 3t^6$ → Highest power of $t = 6$ ∴ Degree = 6

x) 5 → Degree $= 0$ as there is no variable.

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7. i) $xy + yz + zx + 3xyz \longrightarrow$ Degree $= 3$

iv) $a^5 - b^5 - 2a^3b^3 \longrightarrow$ Degree $= 6$

vi) $1 + 2x + 5x^2y + 6yz^2 \longrightarrow$ Degree $= 3$

8. ii) $x^3 - 8x^2 + 14x - 7$ $\Big[$ given, $x = -1$ $\Big]$

$= (-1)^3 - 8 \times (-1)^2 + 14 \times (-1) - 7$

$= -1 - 8 - 14 - 7 = -30$ (Answer)

10) Given, $x = 4$, $y = 3$, $z = -2$

ii) $x^3 + y^3 + z^3 - 3xyz$

$= (4)^3 + (3)^3 + (-2)^3 - 3 \times 4 \times 3 \times (-2)$

$= 64 + 27 - 8 + 72 = 64 + 19 + 72$

$= 155$ (Answer)

11. vi) $9p \times 6q + 5r$ is a trinomial. $\Rightarrow$ False.

viii) $6x^2yz + 5xy^2z - 2xyz^2$ is a trinomial $=$ True.

x) $9x \div 8y$ is a binomial $\Rightarrow$ False.

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End of Ex – 12 (A)

$\dfrac{9x}{8y}$

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1. ii) $5x^2y + (-3x^2y) + \frac{1}{2}x^2y + \frac{4}{5}x^2y$

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

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

   $= \frac{33}{10}x^2y$ (Answer)

   Rough

   $\frac{2}{1} + \frac{1}{2} + \frac{4}{5}$

   $= \frac{20 + 5 + 8}{10}$

   $= \frac{33}{10}$

2. iii) Subtract $-3a^2b$ from $2a^2b$

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

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

   $= 5a^2b$ (Answer)

   iv) Subtract $-5xy^2$ from $-3xy^2$

   $-3xy^2 - (-5xy^2)$

   $= -3xy^2 + 5xy^2$

   $= 2xy^2$ (Answer)

3. iii) $2p + 3r + 4q + 7r + 3p - 2q + q - r - p + 5p + 4q - 8r$

   $= (2p + 3p + 5p - p) + (3r + 7r - r - 8r) + (4q + q + 4q - 2q)$

   $= 9p + r + 7q$ (Answer)

3. v) $1 - x - x^2 - 3x^3 + 2x^2 + x^3 + 3 + x^2 + 5x - 2 + x^3 - x^2 - 3x$

$= (-3x^3 + x^3 + x^3) + (-x^2 + 2x^2 + x^2 - x^2) + (-x + 5x - 3x) + (1 + 3 - 2)$

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

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

vii) $3 + 5y - 4y^2 + 7y^3 - 7 + 2y + 3y^3 + 5 - 6y - 9y^3 + 2y^2$

$= (7y^3 + 3y^3 - 9y^3) + (-4y^2 + 2y^2) + (5y + 2y - 6y) + (3 - 7 + 5)$

$= y^3 - 2y^2 + y + 1$ (Answer)

4. iv) $(x^2 - 2x + 8) - (5x^2 + x - 11)$

$= x^2 - 2x + 8 - 5x^2 - x + 11$

$= x^2 - 5x^2 - 2x - x + 8 + 11$

$= -4x^2 - 3x + 19$ (Answer)

4. vi) $(3x^2y - 2x^3 + y^3 - 5xy^2) - (7x^3 - 6x^2y + 9xy^2 - 2y^3)$

$= 3x^2y - 2x^3 + y^3 - 5xy^2 - 7x^3 + 6x^2y - 9xy^2 + 2y^3$

$= 3x^2y + 6x^2y - 2x^3 - 7x^3 + y^3 + 2y^3 - 5xy^2 - 9xy^2$

$= 9x^2y - 9x^3 + 3y^3 - 14xy^2$ (Answer)

5. $(9x^2 - 8xy + 11y^2) - \{(4x^2 + 7xy + 3y^2 + 1) + (2x^2 - 5xy - 2y^2 + 8)\}$

$= (9x^2 - 8xy + 11y^2) - (4x^2 + 2x^2 + 7xy - 5xy + 3y^2 - 2y^2 + 1 + 8)$

$= (9x^2 - 8xy + 11y^2) - (6x^2 + 2xy + y^2 + 9)$

$= 9x^2 - 8xy + 11y^2 - 6x^2 - 2xy - y^2 - 9$

$= 9x^2 - 6x^2 - 8xy - 2xy + 11y^2 - y^2 - 9$

$= 3x^2 - 10xy + 10y^2 - 9$ (Answer).

6. Required Number $= (3x^2 - 2x + 6) - (2x^2 + 6x - 5)$

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

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

$= x^2 - 8x + 11$ (Answer)

8. Required Number $= (3x^2y - 2xy^2 + 7x - 2y) - (7xy^2 - 5x^2y - 3x + 3y)$

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

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

$= 8x^2y - 9xy^2 + 10x - 5y$ (Answer)

9. Required Number $= (a^2 + b^2 + c^2 - 3abc) - (2a^2 - b^2 - 3c^2 + abc)$

$$= a^2 + b^2 + c^2 - 3abc - 2a^2 + b^2 + 3c^2 - abc$$

$$= a^2 - 2a^2 + b^2 + b^2 + c^2 + 3c^2 - 3abc - abc$$

$$= -a^2 + 2b^2 + 4c^2 - 4abc \quad \text{(Answer)}$$

End of Ex - 12 (B)

Ex-12(c)

1. iii) $7x^2 y^3 \times (-4x^3 y)$

$$= (-4 \times 7) x^{2+3} y^{3+1}$$

$$= -28 x^5 y^4 \quad \text{(Answer)}$$

1. vi) $\left(-\dfrac{5}{8} p^2 q\right) \times \left(\dfrac{16}{25} p q^2\right)$

$$= -\left(\dfrac{\cancel{5}}{\cancel{8}} \times \dfrac{\cancel{16}^{2}}{\cancel{25}_{5}}\right) p^{2+1} q^{1+2}$$

$$= -\dfrac{2}{5} p^3 q^3 \quad \text{(Answer)}$$

2. iii) $(3x^2y - 2xy^2 + 5xy - 6) \times 4xy$

$= (3x^2y \times 4xy) - (2xy^2 \times 4xy) + (5xy \times 4xy) - (6 \times 4xy)$

$= 12x^3y^2 - 8x^2y^3 + 20x^2y^2 - 24xy$ (Ans)

2. iv) $(7a^3 - 5ab^2 - 2b^3 + 3ab + 2a - 5) \times -3ab^2$

$= -(7a^3 \times 3ab^2) + (5ab^2 \times 3ab^2) + (2b^3 \times 3ab^2)$
$\quad - (3ab \times 3ab^2) - (2a \times 3ab^2) + (5 \times 3ab^2)$

$= -21a^4b^2 + 15a^2b^4 + 6ab^5 - 9a^2b^3 - 6a^2b^2$
$\qquad\qquad\qquad\qquad\qquad\qquad + 15ab^2$
$\qquad\qquad\qquad\qquad\qquad\qquad$ (Answer)

3. iii) $(y-4)(y-6)$

$= y(y-6) - 4(y-6)$

$= y^2 - 6y - 4y + 24$

$= y^2 - 10y + 24$ (Answer)

3. vi) $(5x + 4y)(2x - 3y)$

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

$= 10x^2 - 15xy + 8xy - 12y^2$

$= 10x^2 - 7xy - 12y^2$ (Answer)

4. ii) $(3 - 2x + 5x^2) \times (5x - 4)$

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

$= 15x - 10x^2 + 25x^3 - 12 + 8x - 20x^2$

$=. 25x^3 - 10x^2 - 20x^2 + 15x + 8x - 12$

$= 25x^3 - 30x^2 + 23x - 12$ (Answer)

4. iv) $(4x^2 + xy + 9y^2) \times (2x - 3y)$

$= 2x(4x^2 + xy + 9y^2) - 3y(4x^2 + xy + 9y^2)$

$= 8x^3 + 2x^2y + 18xy^2 - 12x^2y - 3xy^2 - 27y^3$

$= 8x^3 + 2x^2y - 12x^2y + 18xy^2 - 3xy^2 - 27y^3$

$= 8x^3 - 10x^2y + 15xy^2 - 27y^3$ (Answer)

5. ii) $(3x^2 + 4x - 5) \times (4x^2 - 7x + 2)$

$= 4x^2(3x^2 + 4x - 5) - 7x(3x^2 + 4x - 5) + 2(3x^2 + 4x - 5)$

$= 12x^4 + 16x^3 - 20x^2 - 21x^3 - 28x^2 + 35x + 6x^2 + 8x - 10$

$= 12x^4 + 16x^3 - 21x^3 - 20x^2 - 28x^2 + 6x^2 + 35x + 8x - 10$

$= 12x^4 - 5x^3 - 42x^2 + 43x - 10$ (Answer)

5. iv) $(6x^3 - 5x^2 + 4x + 1) \times (x^2 + 7x - 1)$

$= x^2(6x^3 - 5x^2 + 4x + 1) + 7x(6x^3 - 5x^2 + 4x + 1) - 1(6x^3 - 5x^2 + 4x + 1)$

$= 6x^5 - 5x^4 + 4x^3 + x^2 + 42x^4 - 35x^3 + 28x^2 + 7x - 6x^3 + 5x^2 - 4x - 1$

$= 6x^5 - 5x^4 + 42x^4 + 4x^3 - 35x^3 - 6x^3 + x^2 + 28x^2 + 5x^2 + 7x - 4x - 1$

$= 6x^5 + 37x^4 - 37x^3 + 34x^2 + 3x - 1$ (Answer)

vi) $(3x^5 - 7x^3 + 2x^2 - x + 4) \times (x^3 - 2x^2 + 3x - 1)$

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

$= 3x^8 - 6x^7 + 9x^6 - 3x^5 - 7x^6 + 14x^5 - 21x^4 + 7x^3 + 2x^5 - 4x^4 + 6x^3 - 2x^2 - x^4 + 2x^3 - 3x^2 + x + 4x^3 - 8x^2 + 12x - 4$

$= 3x^8 - 6x^7 + 9x^6 - 7x^6 - 3x^5 + 14x^5 + 2x^5 - 21x^4 - 4x^4 - x^4 + 7x^3 + 6x^3 + 2x^3 + 4x^3 - 2x^2 - 3x^2 - 8x^2 + x + 12x - 4$

$= 3x^8 - 6x^7 + 2x^6 + 13x^5 - 26x^4 + 19x^3 - 13x^2 + 13x - 4$ (Ans)

1. iii) $\dfrac{+\frac{3}{4} x^2 y z^3}{+\frac{2}{3} x^2 y z}$

$= \dfrac{3}{4} \times \dfrac{3}{2} z^{3-1}$

$= \dfrac{9z^2}{8}$ (Answer)

1. iv) $\dfrac{63 a^4 b^3 c^6}{-14 a^2 b^5 c^4}$

$= -\dfrac{\overset{9}{\cancel{63}}}{\underset{2}{\cancel{14}}} a^{4-2} b^{3-5} c^{6-4}$

$= -\dfrac{9}{2} a^2 b^{-2} c^2$

$= \dfrac{-9 a^2 c^2}{2 b^2}$ (Answer)

2. iii) $\left(14 x^3 y^4 - 7 x^4 y^3 - 28 x^3 y^6\right) \div \left(-7 x^3 y^2\right)$

$= \dfrac{14 x^3 y^4 - 7 x^4 y^3 - 28 x^3 y^6}{-7 x^3 y^2}$

$= \dfrac{\overset{2}{\cancel{14}} x^3 y^4}{\cancel{-7 x^3 y^2}} + \dfrac{\cancel{7} x^4 y^3}{+\cancel{7} x^3 y^2} + \dfrac{\overset{4}{\cancel{28}} x^3 y^6}{+\cancel{7} x^3 y^2}$

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

$= -2 y^2 + x y + 4 y^4$ (Answer)

2. vi)
$$\dfrac{\dfrac{1}{2}p^2v^3 - \dfrac{5}{8}p^3q^2 + \dfrac{1}{4}p^3q^3}{-\dfrac{1}{4}p^2q^2}$$

$$= \dfrac{\dfrac{1}{2}p^2q^3}{-\tfrac{1}{4}p^2q^2} + \dfrac{\dfrac{5}{8}p^3q^2}{+\tfrac{1}{4}p^2q^2} + \dfrac{\dfrac{1}{4}p^3q^3}{-\tfrac{1}{4}p^2q^2}$$

$$= \dfrac{1}{2}\times\left(-\dfrac{4}{1}\right)q^{3-2} + \left(\dfrac{5}{8}\times\dfrac{4}{1}\right)p^{3-2} - p^{3-2}q^{3-2}$$

$$= -2q + \dfrac{5}{2}p' - pq \quad \text{(Answer)}$$

3. iv)
$$x-4\,\big)\,\overline{x^3 - 9x^2 + 26x - 24}\,\big(\,x^2 - 5x + 6$$
$$\underline{(-)x^3 \underset{(+)}{-}4x^2}$$
$$\qquad -5x^2 + 26x$$
$$\qquad \underline{(+)-5x^2 \overset{(-)}{\pm} 20x}$$
$$\qquad\qquad 6x - 24$$
$$\qquad\qquad \underline{(-)6x \underset{(+)}{-}24}$$
$$\qquad\qquad\qquad\quad \text{Answer} \to x^2 - 5x + 6$$
$$\qquad\qquad\qquad\qquad\quad \text{(Answer)}$$

3 v)
$$x-y\,\big)\,x^3 - 3x^2y + 3xy^2 - y^3 \,\big(\,x^2 - 2xy + y^2$$
$$\underline{(-)x^3 \underset{(+)}{-}x^2y}$$
$$\qquad -2x^2y + 3xy^2 - y^3$$
$$\qquad \underline{(+)-2x^2y \underset{(-)}{\pm}2xy^2}$$
$$\qquad\qquad xy^2 - y^3$$
$$\qquad\qquad \underline{(-)xy^2 \underset{(+)}{-}y^3}$$
$$\qquad\qquad\qquad x$$

$$\text{Answer} \to x^2 - 2xy + y^2$$

4. iii)

$$3x-7 \overline{\smash{\big)}\, 6x^3 + x^2 - 26x - 21} \left(2x^2 + 5x + 3 \right.$$

$$\underline{(-)\,6x^3 \;(+)\,-14x^2}$$
$$15x^2 - 26x - 21$$
$$\underline{(-)\,15x^2 \;(+)\,-35x}$$
$$9x - 21$$
$$\underline{(-)\,9x \;(+)\,-21}$$
$$0$$

Answer :- $2x^2 + 5x + 3$

iv)

$$3x+4y \overline{\smash{\big)}\, 12x^2 + 7xy - 12y^2} \left(4x - 3y \right.$$

$$\underline{12x^2 + 16xy}$$
$$(-) \qquad (-)$$
$$-9xy - 12y^2$$
$$\underline{-9xy - 12y^2}$$
$$(+) \qquad (+)$$

Answer $=$ $4x - 3y$

5. ii)

$$x^2 - 5x + 6 \overline{\smash{\big)}\, x^3 - 6x^2 + 11x - 6} \left(x - 1 \right.$$

$$\underline{x^3 \;(-)\,-5x^2 \;(+)\,+6x \;(-)}$$
$$-x^2 + 5x - 6$$
$$\underline{-x^2 \;(+)\,+5x \;(-)\,-6 \;(+)}$$
$$0$$

Answer :- $(x - 1)$

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5. iv)

$$2x^2-6 \overline{)6x^5-28x^3+3x^2+30x-9} \left(3x^3-5x+\frac{3}{2}\right.$$

$$\underset{(-)}{6x^5} \underset{(+)}{18x^3}$$

$$-10x^3+3x^2+30x-9$$

$$\underset{(+)}{-10x^3} \underset{(-)}{+30x}$$

$$3x^2-9$$

$$\underset{(-)}{3x^2} \underset{(+)}{-9}$$

$$0$$

$\therefore$ Answer $= 3x^3-5x+\frac{3}{2}$

6. iv)

$$x^2-2 \overline{)x^6-8} \left(x^4+2x^2+4\right.$$

$$\underset{(-)}{x^6} \underset{(+)}{-2x^4}$$

$$2x^4-8$$

$$\underset{(-)}{2x^4} \underset{(+)}{-4x^2}$$

$$4x^2-8$$

$$\underset{(-)}{4x^2} \underset{(+)}{-8}$$

$$0$$

Answer $= x^4+2x^2+4$

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6. v)

$$x-y \overline{)x^6 - y^6} \left(x^5 + x^4y + x^3y^2 + x^2y^3 + xy^4 + y^5 \right.$$

$$\underline{x^6 - x^5y}$$
$$(-) \quad (+)$$

$$x^5y - y^6$$
$$\underline{x^5y - x^4y^2}$$
$$(-) \quad (+)$$

$$x^4y^2 - y^6$$
$$\underline{x^4y^2 - x^3y^3}$$
$$(-) \quad (+)$$

$$x^3y^3 - y^6$$
$$\underline{x^3y^3 - x^2y^4}$$
$$(-) \quad (+)$$

$$x^2y^4 - y^6$$
$$\underline{x^2y^4 - xy^5}$$
$$(-) \quad (+)$$

$$xy^5 - y^6$$
$$\underline{xy^5 - y^6}$$
$$(-) \quad (+)$$

$$x$$

<u>Answer</u> $= x^5 + x^4y + x^3y^2 + x^2y^3 + xy^4 + y^5.$

7. ii)
$$x^2 - x + 6 \overline{\smash{\big)}\, 2x^4 - x^3 + 10x^2 + 8x - 5} \quad \left(2x^2 + x - 1 \right.$$

$$\begin{array}{r} 2x^4 - 2x^3 + 12x^2 \\ (-) \quad (+) \quad (-) \end{array}$$

$$x^3 - 2x^2 + 8x - 5$$
$$\begin{array}{r} x^3 - x^2 + 6x \\ (-) \quad (+) \quad (-) \end{array}$$

$$-x^2 + 2x - 5$$
$$\begin{array}{r} -x^2 + x - 6 \\ (+) \quad (-) \quad (+) \end{array}$$

$$x + 1$$

$\therefore$ Quotient $= 2x^2 + x - 1$

Remainder $= x + 1$ (Answer)

7. iv)
$$x^3 + 1 \overline{\smash{\big)}\, x^6 + 3x^2 + 10} \quad \left(x^3 - 1 \right.$$

$$\begin{array}{r} x^6 + x^3 \\ (-) \quad (-) \end{array}$$

$$-x^3 + 3x^2 + 10$$
$$\begin{array}{r} -x^3 \quad\quad - 1 \\ (+) \quad\quad (+) \end{array}$$

$$3x^2 + 11$$

Quotient $= x^3 - 1$

Remainder $= 3x^2 + 11$ (Answer)

8)

$$2a^2 - a + 3 \overline{\smash{\big)}\,6a^5 - a^4 + 4a^3 - 5a^2 - a - 15}\,\big(\,3a^3 + a^2 - 2a - 5$$

$$\underset{(-)\quad(+)\quad(-)}{6a^5 - 3a^4 + 9a^3}$$

$$2a^4 - 5a^3 - 5a^2 - a - 15$$
$$\underset{(-)\quad(+)\quad(-)}{2a^4 - a^3 + 3a^2}$$

$$-4a^3 - 8a^2 - a - 15$$
$$\underset{(+)\quad(-)\quad(+)}{-4a^3 + 2a^2 - 6a}$$

$$-10a^2 + 5a - 15$$
$$\underset{(+)\quad(-)\quad(+)}{-10a^2 + 5a - 15}$$

$$0$$

As, $\left(6a^5 - a^4 + 4a^3 - 5a^2 - a - 15\right)$ is exactly divisible by $\left(2a^2 - a + 3\right)$, $\therefore$ $\left(2a^2 - a + 3\right)$ is a factor of $\left(6a^5 - a^4 + 4a^3 - 5a^2 - a - 15\right)$

10) Perimeter of Quadrilateral = Sum of four sides

$$= \left(2x - 3y\right) + \left(7x + y\right) + \left(x + 12y\right) + \left(3y - 4x\right)$$

$$= 2x - 3y + 7x + y + x + 12y + 3y - 4x$$

$$= 2x + 7x + x - 4x + y + 12y + 3y - 3y$$

$$= \left(6x + 13y\right) \text{ units} \quad \underline{\text{(Answer)}}$$

12) Length of rectangle $= (a + 5b)$ units

Breadth of rectangle $= (7a - b)$ units

∴ Perimeter of rectangle $= 2(l + b)$

$$= 2(a + 5b + 7a - b)$$

$$= 2(8a + 4b)$$

$$= (16a + 8b) \text{ units.}$$

Now Perimeter of Square = Perimeter of rectangle

$$= (16a + 8b) \text{ units}$$

∴ Each side of Square $= \dfrac{16a + 8b}{4}$

$$= \dfrac{4(4a + 2b)}{4} = (4a + 2b) \text{ units}$$

∴ Area of Square = Side × Side

$$= (4a + 2b) \times (4a + 2b)$$

$$= (4a + 2b)^2$$

$$= 16a^2 + 2 \times 4a \times 2b + 4b^2$$

$$= (16a^2 + 16ab + 4b^2) \text{ unit}^2$$

Area of rectangle = length × breadth

$$= (a + 5b) \times (7a - b)$$

$$= 7a(a + 5b) - b(a + 5b) = 7a^2 + 35ab - ab - 5b^2$$

$$= 7a^2 + 34ab - 5b^2$$

Difference of Area between square and rectangle

$$= \left(16a^2 + 16ab + 4b^2\right) - \left(7a^2 + 34ab - 5b^2\right)$$

$$= 16a^2 + 16ab + 4b^2 - 7a^2 - 34ab + 5b^2$$

$$= 16a^2 - 7a^2 + 16ab - 34ab + 4b^2 + 5b^2$$

$$= \left(9a^2 - 18ab + 9b^2\right) unit^2 \quad \underline{(Answer)}$$

15) Product of $(2x-3)$ and $(x^2 - 2x + 2)$

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

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

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

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

$$= 2x^3 - 7x^2 + 10x - 6$$

Now

$$2x^3 - 7x^2 + 10x - 6 \overline{)6x^4 - 13x^3 + 2x^2 + 22x - 24}\ \big(3x + 4$$
$$\underline{(-)6x^4 \underset{(+)}{-} 21x^3 \underset{(-)}{+} 30x^2 \underset{(+)}{-} 18x}$$
$$8x^3 - 28x^2 + 40x - 24$$
$$\underline{\underset{(-)}{8x^3} \underset{(+)}{- 28x^2} \underset{(-)}{+ 40x} \underset{(+)}{- 24}}$$
$$0$$

Answer $= \boxed{(3x + 4)}$

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End of Ex —12 (D)