

FOUNDATION⁺ (V₂)

①

Class: VII, MATHEMATICS

3. DIVISION AND MULTIPLICATION OF POLYNOMIALS

TEACHING TASK (JEE MAINS)

01. Volume = $l b h = \left(\frac{3}{4}x + \frac{1}{3}\right) \left(\frac{2}{5}x + \frac{1}{2}\right) \left(\frac{1}{2}x + \frac{2}{5}\right)$
$$= \frac{3}{4} \cdot \frac{2}{5} \cdot \frac{1}{2} \cdot x^3 + \dots$$

Ans: C

$\therefore$ Degree = 3

02. Total weight = $\left(\frac{2}{3}x + \frac{1}{4}\right) \left(\frac{3}{2}x + \frac{5}{6}\right)$
$$= \frac{2}{3} \times \frac{3}{2} x^2 + \frac{2}{3} \times \frac{5}{6} x + \frac{1}{4} \times \frac{3}{2} x + \frac{1}{4} \cdot \frac{5}{6}$$
$$= x^2 + \frac{5}{9}x + \frac{3}{8}x + \frac{5}{24}$$
$$= x^2 + \frac{67}{72}x + \frac{5}{24}$$

Ans: B

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

Ans: B

04. $(2y+4) \overline{) 4y^2 + 6y - 8} \quad \therefore \text{Quotient} = 2y - 1$
$$\begin{array}{r} 4y^2 + 8y \\ \underline{4y^2 + 8y} \\ -2y - 8 \\ \underline{-2y - 4} \\ -4 \end{array}$$

Ans: B

05. $x + \frac{1}{2} \overline{) \frac{3}{2}x^2 + \frac{1}{3}x - \frac{2}{5}} \rightarrow \text{First degree}$

Ans: B

06. $\frac{24a^3 + 48a}{6a + 12} = \frac{4a(6a + 12)}{6a + 12} = 4a$

Ans: D



07. $-\frac{7}{5} \times \frac{3}{2} \times -\frac{6}{5} \cdot x^6 \cdot y^5$ (2)
 $= \frac{63}{25} x^6 \cdot y^5$ Ans: D

08. $(2m^2n - 4mn^2)(6m + 7n)$
 $= 12m^3n + 14m^2n^2 - 24m^2n^2 - 28mn^3$
 $= 12m^3n - 10m^2n^2 - 28mn^3$ Ans: A

09. $4(-1)(2(-1)-6) - 3(-1-2) + 20$
 $= -4(-8) - 3(-3) + 20$
 $= 32 + 9 + 20 = 61$ Ans: B

10. ~~Area~~ Total cost is in Rupees, which is constant. Hence degree = 0 Ans: A

11. Cost $\propto \left(\frac{3}{2}x + \frac{1}{3}\right)^2$
 $= \text{cost} = K\left(\frac{9}{4}x^2 + x + \frac{1}{9}\right) \rightarrow \text{Degree} = 2$ Ans: B

12. $6p^2$ Ans: B

13. $(a+2b)(a-2b) = a^2 - 4b^2 = 25 - 4b^2$
 $\therefore a^2 = 25 \Rightarrow a = \pm 5$ Ans: C

14. Area = $\left(\frac{3}{2}x + \frac{5}{3}\right)\left(\frac{2}{3}x - \frac{1}{2}\right)$
 $= \frac{3}{2} \cdot \frac{2}{3}x^2 - \frac{3}{2} \cdot \frac{1}{2}x + \frac{5}{3} \cdot \frac{2}{3}x - \frac{5}{3} \cdot \frac{1}{2}$
 $= x^2 - \frac{3}{4}x + \frac{10}{9}x - \frac{5}{6}$
 $= x^2 + \frac{13}{36}x - \frac{5}{6}$ Ans: C

15. $(x+2)(x-3) = x^2 - x - 6 = x^2 - mx - 6$
 $\Rightarrow m = 1$ Ans: B

16. $\frac{x^2+4x-12}{x+6} = \frac{(x+6)(x-2)}{x+6} = x-2 = x+m$ (3) $\Rightarrow m = -2$ Ans: D

17. $\frac{2b^3-6b^2+4b}{2b} = \frac{2b(b^2-3b+2)}{2b}$
 $= b^2-3b+2 = b^2-3b+m \Rightarrow m=2$ Ans: D

18.
$$\begin{array}{r} x+2 \overline{) 2x^3+5x^2-x-4} \\ \underline{2x^3+4x^2} \\ x^2-x-4 \\ \underline{x^2+2x} \\ -3x-4 \\ \underline{-3x-6} \\ 2 \end{array}$$
 $\therefore \text{Remainder} = 2$ Ans: A

19. $\frac{1-2+2^2}{1+2+2^2} = \frac{1-2+4}{1+2+4} = \frac{3}{7}$
 Also $\frac{1+a}{3a+1} = \frac{1+2}{3(2)+1} = \frac{3}{7}$ Ans: B, D

20. $\frac{\left(\frac{x^2}{x}\right)}{x^2} = \frac{x^2}{x \cdot x^2} = \frac{1}{x} \text{ or } x^{-1}$ Ans: B, C

21. Statement I: $2xy \times 4x = 8x^2y$ (True)
Statement II: Conceptual (True) Ans: A

22. Statement I: $\frac{4a^4b^2}{6a^2b} = \frac{2}{3}a^2b$ (True)
Statement II: Conceptual (True) Ans: A

23	<u>Assertion:</u> Assertion Conceptual (False) <u>Reason:</u> Conceptual (True)	Ans: D
24	<u>Assertion:</u> Conceptual (True) <u>Reason:</u> Conceptual (True)	Ans: A
25	<u>Assertion:</u> Conceptual (True) <u>Reason:</u> Conceptual (False)	Ans: C
26	<u>Assertion:</u> Conceptual (False) <u>Reason:</u> Conceptual (True)	Ans: D
27	Assertion & Reason are True	Ans: A
28	Assertion & Reason are True	Ans: A
29	Assertion & Reason are True	Ans: A
30	Assertion & Reason are True	Ans: A
31	Assertion & Reason are True	Ans: A
32	Assertion & Reason are True	Ans: A
33	$\frac{5x^2 - 10x}{2x} = \frac{x(5x - 10)}{2x} = \frac{5x - 10}{2}$	Ans: D
34	$\frac{3y^3 + 6y^2 - 9y}{3y} = \frac{3y^3}{3y} + \frac{6y^2}{3y} - \frac{9y}{3y} = y^2 + 2y - 3$	Ans: B
35	$A \times B = 4x^3y \times 6x^2y^2 = 24x^5y^3$	Ans: B
36	$\frac{A}{B} = \frac{4x^3y}{6x^2y^2} = \frac{2x}{3y}$	Ans: C
37	1	Ans: 1
38	$\frac{9}{2}xy^3 \times \frac{2}{9xy^3} \times 5x^0y^0 = 5$	Ans: 5

- 39 a) $-\frac{1}{2}xy$ (r)
 b) 0 (q)
 c) $70xyz$ (s)
 d) $60x^3y$ (p)

Ans: r, q, s, p

- 40 a) $\frac{85x^2}{1.7x^2} = \frac{850}{17} = 50$ (r)
 b) $\frac{8.5x^4}{17x^2} = \frac{85}{170}x^2 = 0.5x^2$ (p)
 c) $\frac{8.5x^4}{1.7x^2} = \frac{85}{17}x^2 = 5x^2$ (s)
 d) $\frac{85x^6}{17x^2} = 5x^4$ (q)

Ans: r, p, s, q

LEARNER'S TASK (CUB'S)

- | | | |
|----|---|--------|
| 01 | Conceptual | Ans: B |
| 02 | $-2a^3b \times 3ab^2c = -6a^4b^3c$ | Ans: C |
| 03 | Conceptual | Ans: B |
| 04 | $3xy(x-y) = 3x^2y - 3xy^2$ | Ans: A |
| 05 | $(\frac{3}{4}x - \frac{2}{5})(x + \frac{1}{2}) \rightarrow \text{Degree} = 2$ | Ans: C |
| 06 | Conceptual | Ans: C |
| 07 | Conceptual | Ans: C |
| 08 | Conceptual | Ans: A |
| 09 | $\frac{3}{2}$ | Ans: A |
| 10 | $\frac{-24a^2b^2c^2}{6ab} = -4abc^2$ | Ans: B |

JEE MAINS · LEVEL

⑥

01. $\frac{14x^2 + 21x}{2x + 3} = \frac{7x(2x + 3)}{2x + 3} = 7x$ Ans: B

02. $(3x + 2)(4x - 5) = 12x^2 - 15x + 8x - 10$
 $= 12x^2 - 7x - 10$ Ans: C

03. $a^{x+y+z} = a^{\frac{3}{2}} \Rightarrow x + y + z = \frac{3}{2}$ Ans: C

04. Total cost = $\left(\frac{2}{3}x + \frac{3}{4}\right)\left(\frac{5}{6}x - \frac{1}{2}\right)$
 $= \frac{2}{3} \times \frac{5}{6}x^2 + \dots$ Quadratic Ans: B

05. Area = $\frac{1}{2}\left(\frac{3}{2}x + \frac{1}{3}\right)\left(\frac{4}{5}x - \frac{2}{3}\right)$
 $= \frac{1}{2} \times \frac{4}{5} \times \frac{3}{2}x^2 + \dots$ Quadratic Ans: B

06. $3(3-2) + 5 = 3 + 5 = 8$ Ans: C

07. Conceptual Ans: B

08. $(a-4)(a^2+3a+5)$
 $= a^3 + 3a^2 + 5a - 4a^2 - 12a - 20$
 $= a^3 - a^2 - 7a - 20$ Ans: D

09. Degree of Dividend = 2
 " " Divisor = 1
 $\therefore$ " " of Quotient = 1 Ans: B

10. $\frac{(-4x^2s^2t)(3rst^3)}{4x^3s^3t^4} = \frac{-12x^2s^3t^4}{4x^3s^3t^4} = \frac{-3}{x}$ Ans: A

11. Degree of $P(x) = 2$
 Degree of $Q(x) = 1$ Ans: C

$\therefore$ Degree of $P(x) \cdot Q(x)$
 $= 2 + 1$
 $= 3$

$$12. \frac{-15t^5s^3}{-25t^4s^2} = \frac{3}{5} \cdot ts \quad \text{Ans: C} \quad \textcircled{1}$$

$$13. \frac{5y^2 + 10y}{5y} = \frac{5y(y+2)}{5y} = y+2 \quad \text{Ans: A}$$

$$14. \frac{6x^2 - 9x}{3x} = \frac{3x(2x^2 - 3)}{3x} = 2x^2 - 3 \quad \text{Ans: C}$$

$$15. \text{Repeated } \frac{4y^2 + 6y + 8}{2y + 4} \Rightarrow \text{Quotient} = 2y - 1$$

$$16. \frac{x^2 + 3x - 2}{x - 1} = (x + 4) + m$$

put $x = 0$

$$\therefore 2 = (0 + 4) + m \Rightarrow m = -2 \quad \text{Ans: } \underline{\underline{=}}$$

$$17. (x + \frac{1}{2})(x - \frac{1}{2}) = x^2 - \frac{1}{4} \quad \text{Ans: B}$$

$$18. \frac{20x^3y + 12x^2y^2 - 12xy}{2xy}$$

$$= \frac{20x^3y}{2xy} + \frac{12x^2y^2}{2xy} - \frac{12xy}{2xy}$$

$$= 10x^2 + 6xy - 6$$

$$= 2(5x^2 + 3xy - 3) \quad \text{Ans: A, C}$$

$$19. \frac{x^3 - 27}{x - 3} = \frac{x^3 - 3^3}{x - 3} = \frac{(x - 3)(x^2 + 3x + 9)}{(x - 3)}$$

$$= x^2 + 3x + 9 \quad \text{Ans: A, B, C, D}$$

20 Statement I: $\frac{-15x^2yz^4}{5xz^2} = -3xyz^2$ (False) ②

Statement II: Conceptual (True) Ans: D

21 Statement I: $(x+4)(x-4) = x^2-16$ (True)

Statement II: Degree of x^2-16 is 2 (True) Ans: A

22 Assertion: Conceptual (True)

Reason: Conceptual (True) Ans: A

23 Assertion: Conceptual (False)

Reason: Conceptual (True) Ans: D

24 Assertion: Conceptual (True)

Reason: Conceptual (True) Ans: A

25 Assertion: Conceptual (True)

Reason: Conceptual (True) Ans: A

26 Assertion: Conceptual (True)

Reason: Conceptual (True) Ans: A

27 Assertion: Conceptual (True)

Reason: Conceptual (True) Ans: A

28 $\frac{3a^2b \times 4b^2c}{2a^2b^2} = 6bc$

Ans: B

29 $3a^2b \times 4b^2c = 12a^2b^3c$

Ans: A

30 $P(x) = (x+2)(x-3) = x^2 - x - 6$

Ans: A

31 Degree of $P(x) = 2$, Degree of $Q(x) = 2$

$\therefore$ Degree of $P(x) \cdot Q(x) = 2+2 = 4$

Ans: C

$$32 \quad 6x^2y^2 \times 4x^{-2}y^{-2}$$

$$= \frac{6x^2y^2 \times 4}{x^2y^2} = 24$$

9

Ans: 24

$$33 \quad \frac{x^3 - 27}{x - 3} = x^2 + 3x + K$$

put $x = 0$

$$\boxed{9 = K}$$

Ans: 9

$$34 \quad A) \frac{8x^2y^3}{2xy} = 4xy^2 (s)$$

$$B) \frac{35x^3yz^2}{-7xyz} = -5x^2z (p)$$

$$C) \frac{-15x^3yz^3}{-5xyz^2} = 3x^2z (q)$$

$$d) \frac{6x^5 + 18x^4 - 3x^2}{3x^2}$$

$$= \frac{3x^2(2x^3 + 6x^2 - 1)}{3x^2} = 2x^3 + 6x^2 - 1 (r)$$

Ans: s, p, q, r

$$35 \quad A) (1+2)(1+3) = 3 \times 4 = 12 (p)$$

$$B) (5-4)(5+4) = (1)(9) = 9 (q, s)$$

$$C) \frac{36-9}{6-3} = \frac{27}{3} = 9 (q, s)$$

$$d) \frac{0-27}{0-3} = 9 (q, s)$$

Ans: p, (q, s), (q, s), (q, s)

$\Rightarrow$ THE END $\Leftarrow$