

OPERATIONS ON POLYNOMIALS

Class: VII. Mathematics

SOLUTIONS

①
(F)

TEACHING TASK

01. $-7x^3 + 2x^2 - 9x^3 + 6x^2 - 7x + 6 + 3x - 9$

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

Ans: C

02. $(\cancel{4x^2 + 7xy + 3y^2 + 1}) + (\cancel{2x^2 - 5xy}$

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

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

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

$$= 3x^2 - 10xy + 10y^2 - 9$$

Ans: A

03. $(\frac{1}{3}y^3 + \frac{5}{7}y^2 - 2) - (-\frac{2}{3}y^3 - \frac{2}{7}y^2 - 5)$

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

$$= y^3 + y^2 + 3$$

Ans: B

04. $(-4p^2q^2) \times (-3p^2q^2) = 12p^4q^4$

Ans: D

05-

$$05. \frac{16x^4 + 8x^3 + 4x^2 + 6x}{Ax} = 8x^3 + 4x^2 + 2x + 3 \quad (2)$$

$$\Rightarrow \frac{16x^3 + 8x^2 + 4x + 6}{A} = 8x^3 + 4x^2 + 2x + 3$$

$$\therefore \frac{16}{A} = 8 \Rightarrow A = 2$$

$$\text{Now, } \frac{8x^3 + 4x^2 + 10x}{Ax} = \frac{8x^3 + 4x^2 + 10x}{2x} = 4x^2 + 2x + 5 \quad \text{Ans: D}$$

$$06. \left(\frac{7}{2} - \frac{x}{3} - \frac{x^2}{5} \right) - \left(\frac{9}{2} + \frac{x}{2} + \frac{3}{5}x^2 + \frac{7}{4}x^3 \right) = \frac{7}{2} - \frac{x}{3} - \frac{x^2}{5} - \frac{9}{2} - \frac{x}{2} - \frac{3}{5}x^2 - \frac{7}{4}x^3 = -1 - \frac{5}{6}x - \frac{4}{5}x^2 - \frac{7}{4}x^3 \quad \text{Ans: A}$$

$$07. \frac{A \times B}{4xy} = \frac{32x^8y^4 + 16x^4y^3 + 4x^2y^4}{4xy}$$

$$= 8x^7y^3 + 4x^3y^2 + xy^3$$

$$B = \frac{16x^5y^4}{4x^2y^2} = 4x^3y^2$$

$$\frac{A \times B}{4x^3y^3} = \frac{(8x^7y^3 + 4x^3y^2 + xy^3) \times 4x^3y^2}{4x^3y^3}$$

$$= 8x^7y^3 + 4x^3y^2 + xy^3 \quad \text{Ans: A}$$

OR Conceptual A	Ans: A
9. $\frac{3}{2}a - \frac{5}{4}b + \frac{2}{5}c + \frac{2}{3}a - \frac{7}{2}b + \frac{1}{2}c + \frac{5}{3}a + \frac{1}{2}b - \frac{5}{9}c$ $= (\frac{3}{2} + \frac{2}{3} + \frac{5}{3})a + (-\frac{5}{4} - \frac{7}{2} + \frac{1}{2})b + (\frac{1}{2} + \frac{1}{2} - \frac{5}{9})c$ $= \frac{23}{6}a - \frac{9}{4}b + \frac{53}{90}c$ Ans: A	
10. $A+B+C = (\frac{7}{2} + \frac{3}{2})x^3 + (-\frac{1}{2} + \frac{7}{2} + \frac{3}{2})x^2$ $+ (-1 - \frac{5}{2})x + (\frac{5}{3} + \frac{1}{3} - 2)$ $= 5x^3 + \frac{9}{2}x^2 - \frac{7}{2}x$ Ans: C	
11. $\frac{2a}{3} + \frac{4a}{3} + 8a$ $= \frac{6a}{3} + 8a = 2a + 8a = 10a > 9a > 8a$ Ans: A, D	
12. $[9m(m-12)] - [6m(m-13) + 5m(3-m)]$ $= (9m^2 - 108m) - (6m^2 - 78m + 15m - 5m^2)$ $= 9m^2 - 108m - 6m^2 + 78m - 15m + 5m^2$ $= 8m^2 - 45m$ Ans: —	
13. $\frac{2 + 4m^3 + 2m^4 - m^6}{12m^2}$	

15. Statement I: $3x^2 + x + a = 8$ (5)

$$\Rightarrow 3(1)^2 + (1) + a = 8$$

$$\Rightarrow 3 + 1 + a = 8$$

$$\Rightarrow a = 4 \quad (\text{True})$$

Statement II: Conceptual (True) Ans: A

16. Statement I: $ab \times a^2b$

$$= a^3b^2$$

$$= (1)^3(2)^2 = 4 \quad (\text{True})$$

Statement II: Conceptual (True) Ans: A

17. $A = \frac{18x^4y^2 + 15x^2y^2 - 27x^2y}{-3xy}$

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

Ans: D

18. $B = \frac{144x^3y^8}{9xy^2} = 16x^2y^6$

Ans: B

19. $A \times B = (-6x^3y - 5xy + 9x)(16x^2y^6)$
 $= -96x^5y^7 + 80x^3y^7 + 144x^3y^6$

Ans: A

20. $5 - 2 = 3$

Ans: 3

21. $16a - [3a + \{4b - 2a + b + 5a\} - 7b]$
 $= 16a - [3a + 5b + 3a - 7b]$
 $= 16a - [6a - 2b] = 16a - 6a + 2b = 10a + 2b$

Ans:

⑥

$$22) a) -6x^2y \times 7x^3y^3 = -42x^5y^4$$

$$b) -4a \times -6a^2bc^3 \times 2a^3b^4c^3 = 48a^6b^5c^7$$

$$c) 4a \times 5b \times -6ab = -120a^2b^2$$

$$d) -\frac{3}{5}x^2 \times \frac{15}{6}y^3 \times \frac{4}{7}x^2y^2z^2$$

$$= -\frac{6}{7}x^4y^4z^2$$

Ans: S, x, y, P

$$23) a) (2a+3b)(4a^2-6ab+9b^2) = (2a)^3 + (3b)^3 \\ = 8a^3 + 27b^3$$

$$b) (3a+4b)(9a^2-12ab+16b^2) = (3a)^3 + (4b)^3 \\ = 27a^3 + 64b^3$$

$$c) (4a+3)(16a^2-12a+9) = (4a)^3 + (3)^3 \\ = 64a^3 + 27$$

$$d) (5a-3)(25a^2+15a+9) = (5a)^3 - (3)^3 \\ = 125a^3 - 27$$

Ans: 4a, P, S

LEARNER'S TASK

CUBES

$$01. (3a^2b-4a^2b) + (9a^2b) = 8a^2b \quad \text{Ans: B}$$

$$02. A+B = x^2+a+1+x^2-x+1 \\ = 2x^2+2 \quad \text{Ans: C}$$

03	$0 - (-3xy) = 3xy$	Ans: A
04	$(4a+3) - (-5a+6)$ $= 4a+3-5a-6 = -a-3$	Ans: C
05	$(12xy) - (-5xy) = 12xy+5xy = 17xy$	Ans: C
06	$4x^3 \times -3xy = -12x^4y$	Ans: C
07	$\frac{-14ab}{7a} = -2b$	Ans: D
08	$\frac{-56abc}{7} = -8abc$	Ans: B
09	$\frac{-7x^7y^3}{-7y^3} = x^7$	Ans: C
10	$\frac{a^3b^7}{a^4b^6} = \frac{b}{a}$	Ans: B
<u>IEEE MAIN LEVEL</u>		
01	$A+2B = (x+2)+2(2x) = x+2+4x = 5x+2$	Ans: C
02	$a+b+3a+2b = 4a+3b$ $= 4(0)+3(1) = 3$	Ans: C
03	$(2x^2+3xy) - (3x^2+2xy)$ $= 2x^2+3xy-3x^2-2xy$ $= -x^2+xy$	Ans: C

04. $\frac{16}{9} p^2 q^2 \times \frac{9}{8} p^3 q^2 r$
 $= 2 p^4 q^4 r$
 Ans: A

05. $\frac{5a^3b - 7ab^3}{ab} = 5a^2 - 7b^2$
 Ans: A

06. $\frac{A}{B} = \frac{-16x^3y^2 + 15x^2y^3}{-\frac{5}{2}x^2y^2}$
 $= 4x - \frac{15}{2}y$
 Ans: A

07. $4x^2 - 5xy + 3y^2 + 8x^2 + 7xy - 6y^2 - 2x^2 - 9xy + 13y^2$
 $= 10x^2 - 7xy + 10y^2$
 Ans: B

08. $(a^4 + 4a^2b^2 + b^4) - (a^4 - 8a^2b^2 + b^4)$
 $= a^4 + 4a^2b^2 + b^4 - a^4 + 8a^2b^2 - b^4$
 $= 12a^2b^2$
 Ans: D

09. $(2p^2q^2) \times (-\frac{3}{4}p^3q) \div (-5p^4q) \times (pq^2)$
 $= -\frac{3}{2}p^5q^3 - 5p^5q^3$
 $= -\frac{13}{2}p^5q^3$
 Ans: B

10. $5a^6 \times (-10ab^2) \times (-2 \cdot 1a^2b^3)$
 $= 105a^9b^5 = 105(1)^9(\frac{1}{2})^5 = \frac{105}{32}$
 Ans: C

11.
$$\frac{-16}{15} xy z^2 \times \frac{-25}{24} x^3 z$$

$$= \frac{16}{9} x^4 y z^3 = \frac{16}{9} (-1)^4 (-4) (-2)^3$$

$$= \frac{320}{9}$$

 Ans: A

12. Perimeter = $3a$
 $= 3(x - 2y + 3xy)$
 $= 3x - 6y + 9xy$
 Ans: A/C

13. Statement I:

$$- (x^2 - 2xy + y^2) + (x^2 + 2xy + y^2) - (x^2 - 4xy + 4y^2)$$

$$= -x^2 + 2xy - y^2 + x^2 + 2xy + y^2 - x^2 + 4xy - 4y^2$$

$$= -x^2 + 8xy - 4y^2 \quad (\text{False})$$

Statement II: clearly it is false statement

Ans: B

14. Statement I: $\frac{1c}{10} \div \frac{1c}{4} = \frac{1c}{10} \times \frac{4}{1c} = \frac{4}{10} = \frac{2}{5} \quad (\text{True})$

Statement II: $\frac{7}{30} \times \frac{75p}{14} = \frac{5p}{4} \quad (\text{True})$

Ans: A

15. $A + B =$

$$\begin{aligned}
 15 \quad A+B &= 6px - 2qy + 3xz + 6qy - xz - 11px \\
 &= -5px + 4qy + 2xz
 \end{aligned}$$

Ans: A

$$\begin{aligned}
 16 \quad A+2B &= (6px - 2qy + 3xz) + 2(6qy - xz - 11px) \\
 &= 6px - 2qy + 3xz + 12qy - 2xz - 22px \\
 &= -16px + 10qy - xz
 \end{aligned}$$

Ans: C

$$\begin{aligned}
 17. \quad A+B+C &= 6px - 2qy + 3xz + \\
 &\quad 6qy - xz - 11px + \\
 &\quad 10xz - 2px - 3qy \\
 &= -7px + 2y + 12xz
 \end{aligned}$$

Ans: B

$$\begin{aligned}
 18 \quad A+B &= (7x^2 - 4x + 5) + (-3x^2 + 2x - 1) \\
 &= 7x^2 - 4x + 5 - 3x^2 + 2x - 1 \\
 &= 4x^2 - 2x + 4
 \end{aligned}$$

$\Rightarrow$ THE END $\in$