7th (Algebraic Expressions & Identities (Chapter-4)

Level-I

Exc-I

1. $3a^2b + (-4a^2b) + 9a^2b = (3-4+9)a^2b$

$= 8a^2b$

2. $\frac{2}{3}a + \frac{3}{5}a + (-\frac{6}{5}a) = \left(\frac{2}{3} + \frac{3}{5} - \frac{6}{5}\right)a$

$= \left(\frac{2\times5 + 3\times3 - 6\times3}{15}\right)a$ [LCM of (3, 5, 5) = 15]

$= \frac{1}{15}a$

3. $(4xy^2 - 7x^2y) + (12x^2y - 6xy^2) + (-3x^2y + 5xy^2)$

$\Rightarrow (4 - 6 + 5)xy^2 + (-7 + 12 - 3)x^2y$

$\Rightarrow 3xy^2 + 2x^2y$

4. $\left[\frac{3}{2}a - \frac{5}{4}b + \frac{2}{5}c\right] + \left[\frac{2}{3}a - \frac{7}{2}b + \frac{7}{2}c\right] + \left[\frac{5}{2}b - \frac{5}{4}c\right]$

$\Rightarrow \left[\frac{3}{2} + \frac{2}{3}\right]a + \left[-\frac{5}{4} - \frac{7}{2} + \frac{5}{2}\right]b + \left[\frac{2}{5} + \frac{7}{2} - \frac{5}{4}\right]c$

$\Rightarrow \frac{13}{6}a - \frac{9}{4}b + \frac{53c}{20}$

5. $12xy - (-5xy) = 12xy + 5xy = 17xy$

6. $-7a^2 - (2a^2) = -9a^2$

7. $3a - 5b - (2a - b) = (3-2)a + (-5+1)b = a - 4b$

8. $4x^3 + x^2 + x + 6 - [2x^3 - 4x^2 + 3x + 5]$

$\Rightarrow (4-2)x^3 + (1+4)x^2 + (1-3)x + (6-5)$

$\Rightarrow 2x^3 + 5x^2 - 2x + 1$

9. $\left[\frac{1}{3}y^3 + \frac{5}{7}y^2 + y - 2\right] - \left[\frac{2}{3}y^3 - \frac{2}{7}y^2 - 5\right]$

$\Rightarrow \left[\frac{1}{3} - \frac{2}{3}\right]y^3 + \left[\frac{5}{7} + \frac{2}{7}\right]y^2 + y + [-2+5]$

$\Rightarrow -\frac{1}{3}y^3 + y^2 + y + 3$

10. $\left[\frac{2}{3}x + \frac{3}{2}y - \frac{4}{3}z\right] - \left[\frac{3}{2}x - \frac{5}{4}y - \frac{7}{2}z\right]$

$\Rightarrow \left[\frac{2}{3} - \frac{3}{2}\right]x + \left[\frac{3}{2} + \frac{5}{4}\right]y + \left[-\frac{4}{3} + \frac{7}{2}\right]z$

$\Rightarrow -\frac{5}{6}x + \frac{11}{4}y + \frac{13}{6}z$

11. $(7ab) \times (-5ab^2c) \times (6abc^2) = (7 \times -5 \times 6)a^{1+1+1}b^{1+2}c^{1+2}$

$= -210a^3b^4c^3$

12. $(-5a) \times (-10a^2) \times (-2a^3) = (-5 \times -10 \times -2) \times a^6$

$= -100a^6$

13. $(-4x^3) \times (-6xy^2) \times (-3yz^2) = (-4 \times -6 \times -3) \times x^4y^3z^2$

$= -72x^4y^3z^2$

14. $\left(-\frac{2}{7}a^4\right) \times \left(-\frac{3}{4}a^2b\right) \times \left(-\frac{14}{5}b^2\right) = \left[-\frac{2}{7} \times -\frac{3}{4} \times -\frac{14}{5}\right]a^6b^3 = -\frac{3}{5}a^6b^3$

15. $\left(\frac{7}{9}ab^2\right) \times \left(\frac{15}{7}ac^2b\right) \times \left(\frac{-3}{5}a^2c\right)$

$\Rightarrow \left(\frac{7}{9} \times \frac{15}{7} \times \frac{-3}{5}\right) a^4 b^3 c^3 = -a^4 b^3 c^3$

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

$= 6a^4 + 10a^3b$

17. $-11a(3a+2b) = -11a \times 3a - 11a \times 2b$

$= -33a^2 - 22ab$

18. $-5a(7a-2b) = -5a \times 7a + (-5a) \times (-2b)$

$= -35a^2 + 10ab$

19. $-11y^2(3y+7) = -11y^2 \times 3y + (-11y^2) \times 7$

$= -33y^3 - 77y^2$

20. $\frac{6x}{5}(x^3+y^3) = \frac{6}{5}x \times x^3 + \frac{6x}{5} \times y^3$

$= \frac{6}{5}x^4 + \frac{6}{5}xy^3$

Level - 2

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

$\Rightarrow 2x^5 - 2x^3 - 3x^5 - 6x^2 - 2x^4 + 6x^2$

$\Rightarrow (2-3)x^5 - 2x^4 + (-2)x^3 + 6x^2$ $(2-3)x^5 - 2x^4 - 2x^3$

$\Rightarrow -x^5 - 2x^4 + 2x^3 - 6x^2$ $-x^5 - 2x^4 - 2x^3$

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

$\Rightarrow x^5y - 2x^4y + 2x^4y - 2x^5y$

$\Rightarrow -x^5y$

3. $3a^2 + 2(a+2) - 3a(2a+1)$

$\Rightarrow 3a^2 + 2a + 4 - 6a^2 - 3a$

$\Rightarrow -3a^2 - a + 4$

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

$\Rightarrow x^2 + 4x + 6x^3 - 3x + 4x^2 + 4$

$\Rightarrow 6x^3 + 5x^2 + x + 4$

5. $a(b-c) - b(c-a) - c(a-b)$

$\Rightarrow ab - ac - bc + ab - ac + bc$

$\Rightarrow 2ab - 2ac$

6. $a(b-c) + b(c-a) + c(a-b)$

$\Rightarrow ab - ac + bc - ab + ac - bc = 0$

7. $4ab(a-b) - 6a^2(b-b^2) - 3b^2(2a^2-a) + 2ab(b-a)$

$\Rightarrow 4a^2b - 4ab^2 - 6a^2b + 6a^2b^2 - 6a^2b^2 + 3ab^2 + 2ab^2 - 2a^2b$

$\Rightarrow -4a^2b + ab^2$

8. $x^2(x^2+1) - x^3(x+1) - x(x^3-x)$

$\Rightarrow x^4 + x^2 - x^4 - x^3 - x^4 + x^2 \Rightarrow \boxed{-x^4 - x^3 + 2x^2}$

9. $2a^2 + 3a(1-2a^3) + a(a+1)$

$\Rightarrow 2a^2 + 3a - 6a^4 + a^2 + a$

$\Rightarrow -6a^4 + 3a^2 + 4a$

10. $a^2(2a-1) + 3a + a^3 - 8$

$\Rightarrow 2a^3 - a^2 + 3a + a^3 - 8$

$\Rightarrow 3a^3 - a^2 + 3a - 8$

11. $(x+2)^2 = x^2 + x^2 + 4x + 4$ [use identity $(a+b)^2$]

12. $(2m+1)^2 = 4m^2 + 4m + 4$ [use identity $(a+b)^2$]

13. $\left[x + \frac{x^2}{2}\right]^2 = x^2 + \left(\frac{x^2}{2}\right)^2 + 2 \times x \times \frac{x^2}{2}$

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

14. $(2x+y)(2x+y) = 4x^2 + 4xy + y^2$

15. $\left[\frac{4x}{5} - \frac{3y}{4}\right]\left[\frac{4x}{5} + \frac{3y}{4}\right] = \left(\frac{4x}{5}\right)^2 - \left[\frac{3y}{4}\right]^2$

$= \frac{16x^2}{25} - \frac{9y^2}{16}$ [use identity $(a-b)(a+b) = a^2 - b^2$]

16. $\left[2x + \frac{3}{y}\right]\left[2x - \frac{3}{y}\right] = (2x)^2 - \left(\frac{3}{y}\right)^2$ [copy it here]

$= 4x^2 - \frac{9}{y^2}$

17. $\left(x^3+\frac{1}{x^3}\right)\left(x^3-\frac{1}{x^3}\right)=(x^3)^2-\left(\frac{1}{x^3}\right)^2$ $[(a-b)(a+b)=a^2-b^2]$

$=x^6-\frac{1}{x^6}$

18. $\left[x^4+\frac{2}{x^2}\right]\left[x^4-\frac{2}{x^2}\right]=(x^4)^2-\left(\frac{2}{x^2}\right)^2$ $[(a-b)(a+b)=a^2-b^2]$

$=x^8-\frac{4}{x^4}$

19. $(2m-1)^2=4m^2+1-4m$ [use $(a-b)^2=a^2+b^2-2ab$]

20. $a^2(1-a)-a^2+a^3$

$\Rightarrow a^2-a^3-a^2+a^3=0$

Ex-2

Level-I

1. (i) $250.5\,xy\left(x2+\frac{y}{10}\right)$

$250.5\,x^2y2+25.05xy^2$

(ii) $\frac{7}{5}x^2y\left(\frac{3}{5}xy^2+\frac{2}{5}x\right)$

$\frac{7}{5}\times\frac{3}{5}x^3y^3+\frac{7}{5}\times\frac{2}{5}x^3y$

$\frac{21}{25}x^3y^3+\frac{14}{25}x^3y$

(iii) $\frac{4}{3}a(a^2+b^2-3c^2)=\frac{4}{3}a^3-\frac{4}{b}ab^2-4ac^2$

2. $24x^2(1-2x)=24x^2-48x^3$

at $x=3$ $=24\times(3)^2-48(3)^3=24\times9-48\times27$

$=216-1296=-1080$

3. $-3y(xy+y^2) = -3xy^2 - 3y^3$

at $x=4$ & $y=5$ $\Rightarrow -3\times4\times(5)^2 - 3\times(5)^3$

$\Rightarrow -300 - 375 = -675$

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

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

$= -3\times8 + \frac{3}{2}\times16$

$= -24+24 = 0$

5. (i) $15y^2(2-3x) = 30y^2 - 45xy^2$

at $x=-1$ & $y=0.25$ $\Rightarrow 30\times(0.25)^2 - 45\times(-1)\times(0.25)^2$

$\Rightarrow 30\times\left(\frac{1}{4}\right)^2 + 45\times\left(\frac{1}{4}\right)^2$

$\Rightarrow \frac{30}{16} + \frac{45}{16} = \frac{75}{16} = 4.6875$

(ii) $-3x(y^2+z^2) = -3xy^2 - 3xz^2$

at $x=-1$, $y=0.25$ & $z=0.05$ $\Rightarrow -3\times(-1)\times(0.25)^2 - 3\times(-1)\times(0.05)^2$

$= 3\times\left(\frac{1}{4}\right)^2 + 3\times\left(\frac{1}{20}\right)^2$

$= \frac{3}{16} + \frac{3}{400} = \frac{75+3}{400}$

$= \frac{78}{400} = 0.195$

(iii) $z^2(x-y) = z^2x - z^2y$

at $x=-1$, $y=0.25$ & $z=0.05$

$$\Rightarrow (0.05)^2 \times (-1) - (0.05)^2 \times (0.25)$$

$$= \left(\frac{1}{20}\right)^2 \times (-1) - \left(\frac{1}{20}\right)^2 \times \frac{1}{4}$$

$$= \frac{-1}{400} - \frac{1}{400\times 4} = \frac{-5}{1600} = -0.003125$$

(iv) $xz(x^2+y^2) = x^3z + xy^2z$

at $x=-1$, $y=0.25$ & $z=0.05$

$$\Rightarrow (-1)^3 \times (0.05) + (-1) \times (0.25)^2 \times (0.05)$$

$$\Rightarrow -1 \times \frac{1}{20} - 1 \times \left(\frac{1}{4}\right)^2 \times \frac{1}{20}$$

$$\Rightarrow \frac{-1}{20} - \frac{1}{320} = \frac{-17}{320} = -0.053125$$

6. (i) $[102]^2 = (100+2)^2 = (100)^2 + 2^2 + 2\times 2\times 100$

$$= 10000 + 4 + 400 = 10404$$

(ii) $(99)^2 = (100-1)^2 = (100)^2 + (-1)^2 + 2\times(-1)\times 100$

$$= 10000 + 1 - 200 = 9801$$

(iii) $(1001)^2 = (1000+1)^2 = (1000)^2 + 1^2 + 2\times 1\times 1000$

$$= 1000000 + 1 + 2000$$

$$= 1002001$$

(iv) $(999)^2 = [1000-1]^2 = (1000)^2 + (-1)^2 + 2\times(-1)\times(1000)$

$$= 1000000 + 1 - 2000$$

$$= 998001$$

(vi) $(703)^2 = [700+3]^2 = [700]^2 + 3^2 + 2\times700\times3$

$= 490000 + 9 + 4200$

$= 494209$

7. (i) $82^2 - 18^2 = (82+18)(82-18)$

$= 100 \times 64 = 6400$

(ii) $(467)^2 - 33^2 = (467+33)(467-33)$

$= 500 \times 434 = 217000$

(iii) $(79)^2 - (69)^2 = (79-69)\times(79+69)$

$= 10 \times 148 = 1480$

(iv) $197 \times 203 = (200-3)(200+3)$

$= (200)^2 - 9 = 40000 - 9 = 39991$

(v) $113 \times 87 = (100+13)(100-13)$

$= (100)^2 - (13)^2 = 10000 - 169 = 9831$

(vi) $95 \times 105 = (100-5)(100+5) = (100)^2 - (5)^2 = 10000 - 25$

$= 9975$

(vii) $1.8 \times 2.2 = (2-0.2)(2+0.2) = (2)^2 - (0.2)^2 = 4 - 0.04$

$= 3.96$

(viii) $9.8 \times 10.2 = (10-0.2)(10+0.2) = (10)^2 - (0.2)^2 = 100 - 0.04$

$= 99.96$

8. (i) $\dfrac{(58)^2 - (42)^2}{16} = \dfrac{(58-42)(58+42)}{16} = \dfrac{16\times100}{16} = 100$

(ii) $178 \times 178 - 22 \times 22 = (178+22)(178-22) = 200 \times 156$

$= 31200$

(iii) $\frac{198 \times 198 - 102 \times 102}{96} = \frac{(198-102) \times (198+102)}{96} = \frac{96 \times 300}{96} = 300$

(iv) $1.73 \times 1.73 - 0.27 \times 0.27 = (1.73-0.27) \times (1.73+0.27) = 1.46 \times 2$

$= 2.92$

(v) $\frac{8.63 \times 8.63 - 1.37 \times 1.37}{0.726} = \frac{(8.63-1.37)(8.63+1.37)}{0.726}$

$= \frac{7.26 \times 10}{0.726} = 100$

9. (i) $4x = (52)^2 - (48)^2$

$4x = (52+48)(52-48)$

$4x = 100 \times 4 \Rightarrow x = 100$

(ii) $14x = (47)^2 - (33)^2 = (47-33)(47+33)$

$14x = 14 \times 80$

$x = 80$

(iii) $5x = (50)^2 - (40)^2$

$5x = (50-40) \times (50+40)$

$5x = 10 \times 90$

$x = 2 \times 90 = 180$

10. $x + \frac{1}{x} = 20$

$\left(x + \frac{1}{x}\right)^2 = (20)^2 \Rightarrow x^2 + \frac{1}{x^2} + 2 \times x \times \frac{1}{x} = 400$

$x^2 + \frac{1}{x^2} = 400 - 2 = 398$

11. $x - \frac{1}{x} = 3$

$\left(x - \frac{1}{x}\right)^2 = 9 \Rightarrow x^2 + \frac{1}{x^2} - 2 \times x \times \frac{1}{x} = 9$

$x^2 + \frac{1}{x^2} = 9 + 2 = 11$

$\left(x^2 + \frac{1}{x^2}\right)^2 = (11)^2$

$x^4 + \frac{1}{x^4} + 2 \times x^2 \times \frac{1}{x^2} = 121$

$x^4 + \frac{1}{x^4} = 121 - 2 = 119$

12. $x^2 + \frac{1}{x^2} = 18$

$x^2 + \frac{1}{x^2} + 2 = 20$

$\left(x + \frac{1}{x}\right)^2 = 20 \Rightarrow x + \frac{1}{x} = \pm\sqrt{20}$

$x^2 + \frac{1}{x^2} - 2 = 16$

$\left(x - \frac{1}{x}\right)^2 = 16 \Rightarrow x - \frac{1}{x} = \pm 4$

13. $x + y = 4 \quad xy = 2$

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

$x^2 + y^2 + 2xy = 16 \Rightarrow x^2 + y^2 = 16 - 4 = 12$

14. $x-y=7$, $xy=9$

$(x-y)^2=7^2$

$x^2+y^2-2xy=49$

$x^2+y^2=49+18=67$

15. $3x+5y=11$; $xy=2$

$(3x+5y)^2=11^2 \Rightarrow 9x^2+25y^2+2\times3x\times5y=121$

$9x^2+25y^2+30\times2=121$

$9x^2+25y^2=61$

Level-2

1. (i) $4x^2-12x+7$

$(2x)^2-2\times2x\times3+7=[(2x)^2-2\times2x\times3+3^2]-3^2+7$

$[2x-3]^2+7-9=[2x-3]^2-2$

So 2 must be added.

(ii) $4x^2-20x+20$

$[(2x)^2-2\times2x\times5+5^2]-5^2+20$

$[2x-5]^2-25+20=(2x-5)^2-5$

So 5 must be added.

2. (i) $(x-y)(x+y)(x^2+y^2)(x^4+y^4)$

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

$(x^4-y^4)(x^4+y^4)=x^8-y^8$

(ii) $(2x-1)(2x+1)(4x^2+1)(16x^4+1)$

$(4x^2-1)(4x^2+1)(16x^4+1)$

$(16x^4-1)(16x^4+1) = 256x^8-1$

3. (i) $(7m-8n)^2 + (7m+8n)^2$

$49m^2 + 64n^2 - 112mn + 49m^2 + 64n^2 + 112mn$

$98m^2 + 128n^2$

(ii) $(2.5p - 1.5q)^2 - (1.5p + 2.5q)^2$

$(2.5p)^2 + (1.5q)^2 - 2 \times 2.5p \times 1.5q - [(1.5p)^2 + (2.5q)^2 - 2 \times 1.5p \times 2.5q]$

$6.25p^2 + 2.25q^2 - 7.5pq - 2.25p^2 - 6.25q^2 + 7.5pq$

$4p^2 - 4q^2 = 4(p^2-q^2)$

(iii) $(m^2 - n^2m)^2 + 2m^3n^2$

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

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

$= 4a^2 + 9b^2 + 16c^2 + 12ab + 24bc + 16ac$

(ii) $(a+2b-5c)^2 = a^2 + (2b)^2 + (-5c)^2 + 2(a \times 2b + 2b \times (-5c) + (-5c) \times a)$

$= a^2 + 4b^2 + 25c^2 + 4ab - 20bc - 10ac$

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

$= 9x^2 + 4y^2 + z^2 + 12xy - 4yz - 6xz$

(iv) $\left(\frac{a}{2} - \frac{b}{3} + \frac{c}{4}\right)^2 = \left(\frac{a}{2}\right)^2 + \left(\frac{b}{3}\right)^2 + \left(\frac{c}{4}\right)^2 + 2\left[\frac{a}{2} \times \left(\frac{-b}{3}\right) + \left(\frac{-b}{3}\right) \times \frac{c}{4} + \frac{c}{4} \times \frac{a}{2}\right]$

$= \frac{a^2}{4} + \frac{b^2}{9} + \frac{c^2}{16} - \frac{ab}{3} - \frac{bc}{6} + \frac{ac}{4}$

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

$= x^2 + \frac{4}{x^2} + 9 - 4 - \frac{6}{x} + 3x$

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

5. $a + b + c = 10$, $ab + bc + ca = 31$

$(a+b+c)^2 = 10^2$

$a^2 + b^2 + c^2 + 2(ab + bc + ca) = 100$

$a^2 + b^2 + c^2 = 100 - 2 \times 31 = 100 - 62$

$= 38$

6. $a + b + c = 9$; $a^2 + b^2 + c^2 = 29$

$(a+b+c)^2 = 9^2$

$a^2 + b^2 + c^2 + 2(ab + bc + ca) = 81$

$2(ab + bc + ca) = 81 - 29 = 52$

$ab + bc + ca = 26$

7. $a^2+b^2+c^2 = 45$; $ab+bc+ca = 38$

$$(a+b+c)^2 = a^2+b^2+c^2+2(ab+bc+ca)$$
$$= 45+2\times 38 = 121$$

$$a+b+c = \pm 11$$

8. $a+b-c = 11$; $a^2+b^2+c^2 = 89$

$$(a+b-c)^2 = 11^2$$

$$a^2+b^2+c^2+2(ab-bc-ca) = 121$$

$$89+2(ab-bc-ca) = 121$$

$$ab-bc-ca = \frac{121-89}{2} = \frac{32}{2}$$
$$= 16$$

9. $x-\frac{1}{x} = 7$

$$\left(x-\frac{1}{x}\right)^3 = 7^3$$

$$x^3+\left(\frac{-1}{x}\right)^3+3\times x\times\frac{-1}{x}\left[x-\frac{1}{x}\right] = 243$$

$$x^3-\frac{1}{x^3}-3\times 7 = 243$$

$$x^3-\frac{1}{x^3} = 243+21 = 264$$

$$= \cancel{264}$$

10. $3p-\frac{1}{3p} = 5$

$$\left(3p-\frac{1}{3p}\right)^3 = 5^3$$

$(3p)^3 + \left(\frac{-1}{3p}\right)^3 + 3\times 3p \times \frac{-1}{3p}\left(3p - \frac{1}{3p}\right) = 125$

$27p^3 - \frac{1}{27p^3} - 3 \times 5 = 125$

$27p^3 - \frac{1}{27p^3} = 140$

11. $2x+3y = 7$; $xy = 2$

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

$4x^2 + 9y^2 + 12xy = 49 \Rightarrow 4x^2+9y^2 = 49-24$

$= 25$

12. $a-b = 5$; $ab = 14$

$(a-b)^3 = 125 \Rightarrow a^3 - b^3 - 3ab(a-b) = 125$

$a^3 - b^3 = 125 + 3 \times 14 \times 5$

$= 335$

13. $(4x-5z) = 2$; $xz = 6$

$(4x-5z)^3 = 2^3 \Rightarrow 64x^3 - 125z^3 - 3\times 4x \times 5z(4x-5z) = 8$

$64x^3 - 125z^3 = 8 + 60 \times 6 \times 2$

$= 728$

14.

$$
\begin{array}{r|l}
2x+3 \;\; 8x^3+2x^2+5 & 4x^2 - 5x + \frac{15}{2} \\
\underline{-8x^3 \pm 12x^2} & \\
-10x^2 + 5 & \\
\underline{\mp 10x^2 \quad \pm 15x} & \\
-15x + 5 & \\
\underline{\mp 15x \pm \frac{45}{2}} & \\
0 \quad -\frac{35}{2} &
\end{array}
$$

Quotient is $4x^2 - 5x + 7.5$.

15. $x+1 \overline{)4x^3+2x+1}\ 4x^2-4x+6$

$$\begin{array}{r} -4x^3 \pm 4x^2 \\ \hline -4x^2+2x+1 \\ \mp 4x^2 \mp 4x \\ \hline 6x+1 \\ -6x \pm 6 \\ \hline -5 \end{array}$$

Remainder is -5.

8th × Ratio & Proportion.

Ch-2

Level-I

1. $a:b = 5:4 \quad b:c = 16:25$

we need b same in both ratios

$a:b = 5\times4 : 4\times4$

$= 20:16$ so $a:b:c$ is $20:16:25$.

2. $a:b = 3:4$

$7a-4b : 3a+b = \frac{7a-4b}{3a+b}$ (keep $a=3x$, $b=4x$)

$= \frac{21x-16x}{9x+4x} = \frac{5x}{13x} = \frac{5}{13}$

3. $\frac{7x-4y}{3x+y} = \frac{5}{13}$ (Cross Multiply)

$91x-52y = 15x+5y$

$76x = 57y$

$\frac{x}{y} = \frac{57}{76} = \frac{3}{4} \Rightarrow x:y = 3:4$