Math

Unit 4

Ex 4.1

Q1

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

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

ii) $3nx - 3x - 3ny + 3y$

$3(nx - x - ny + y)$

$3[x(n-1) - y(n-1)]$

$3[(n-1)(x-y)]$ Ans.

iii) $18x^4 + 108x^2y^2 + 162y^4$

$18(x^4 + 6x^2y^2 + 9y^4)$

$18[(x^2)^2 + 2(x^2)(3y^2) + (3y^2)^2]$ $\because a^2 + 2ab + b^2$

$18[x^2 + 3y^2]^2$ Ans. $\because (a+b)^2$

4) $(K+2)^2 - 8(K+2)+16$

$\because a^2 - 2ab + b^2$

$(K+2)^2 - 2(K+2)(4) + (4)^2$

$(K+2-4)^2$

$= (K-2)^2$ Ans.

5) $9x^2 + 4 - 169y^2 - 12x$

$= 9x^2 + 4 - 12x - 169y^2$

$\because a^2 + b^2 - 2ab$

$= (3x)^2 + (2)^2 - 2(3x)(2) - 169y^2$

$\because (a^2 - b^2) = (a+b)(a-b)$

$= (3x-2)^2 - (13y)^2$

$= (3x-2-13y)(3x-2+13y)$ Ans.

6) $(x^2-1)(y+1) - (y+3)(x^2-1)$

$= (x^2-1)[y+1-y-3]$

$= [(x)^2 - (1)^2](-2)$

$= 2(x+1)(x-1)$ Ans

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⑦ $x^2 - 6ax + 9a^2 - 16b^2$

$[(x)^2 - 2(x)(3a) + 3(a)^2] - (4b)^2$

$[x - 3a]^2 - (4b)^2$

$(x - 3a - 4b)(x - 3a + 4b)$ Ans.

⑧ $1 - x^2 - 2xy - y^2$

$1 - (x^2 + 2xy + y^2)$

$= 1 - (x + y)^2$

$= (1)^2 - (x + y)^2$

$= (1 + x + y)(1 - x - y)$

⑨ $(x + y - 2c)(x + 2c + y)$

$(x + y - 2c)(x + y + 2c)$

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

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

10) $x^2+4y^2-z^2+4xy$

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

$=[(x)^2+(2y)^2+2(x)(2y)]-z^2$

$=(x+2y)^2-(z)^2$ Ans.

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

11) a) $2y^2-3y-27 = (y+3)(\ )$

$2y^2-(9y-6y)-27=(x+3)(\ )$

$2y^2-9y+6y-27=(x+3)(\ )$

$y(2y-9)+3(2y-9)$

$(2y-9)(y+3)$

missing factor is $2y-9$

2×27

54

$2\times27=54$

$6\times9=54$

b) $5x^2+12x-9=(\quad)(x+3)$

$5x^2+12x-9$

$5x^2+15x-3x-9$

$5x(x+3)-3(x+3)$

$(x+3)(5x-3)$ Ans.

missing factor is $5x-3$

5×9

45

$3 \times 15 = 45$

(12) x^4+4m^4

$\because a^2+b^2+2ab$

$(x^2)^2+(2m^2)^2+2(x^2)(2m^2)-2(x^2)(2m^2)$

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

$=(x^2+2m^2)^2-4x^2m^2$

$=(x^2+2m^2)^2-(2xm)^2$

$=(x^2+2m^2-2xm)(x^2+2m^2+2xm)$ Ans.

13) m^4+m^2+1

$(m^2)^2+(1)^2+2(m^2)(1)-2(m^2)(1)+m^2$

$(m^2+1)^2-2m^2+m^2$

$(m^2+1)^2-(m)^2$

$(m^2+1-m)(m^2+1+m)$ Ans.

14) $-3x^4-21x^3+24x^2$

$1\times 8=8$

$1\times 8=8$

$-3x^2(x^2+7x-8)$

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

$-3x^2[x(x+8)-1(x+8)]$

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

15) x^8+x^4+1

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

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

$-2x^4$
x^4
$-1x^4$

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

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

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

16) ~~$4x^4+256y^4$~~ $[(x^2)^2+(1)^2+2(x^2)(1)-2(x^2)(1)+x^2](x^4+1-x^2)$

$[(x^2+1)^2-(x^2)](x^4+1-x^2)$

$[(x^2+1-x^2)(x^2+1+x^2)](x^4+1-x^2)$

$4x^4+256y^4$

$4(x^4+64y^4)$

$=4[(x^2)^2+(8y^2)^2+2(x^2)(8y^2)-2(x^2)(8y^2)]$

$4(x^2+8y^2)^2-16x^2y^2$

$4(x^2+8y^2)^2=(4xy)^2$

$4[(x^2+8y^2-4xy)^2(x^2+8y^2+4xy)]$ Ans.

17) $12-7x+x^2$

$x^2-7x+12$

$x^2-4x-3x+12$

$x(x-4)-3(x-4)$

$(x-4)(x-3)$ Ans.

$+1\times12=12$

12

$3\times4=12$

$1+8=9$

$1\times8=8$

18) x^2-9x+8

$x^2-8x-1x+8$

$x(x-8)-1(x-8)$

$(x-8)(x-1)$ Ans.

19) $10z^2 - 29z + 10$

$-4z - 25z$

$10z^2 - 25z - 4z + 10$

$5z(2z - 5) - 2(2z - 5)$

$10z^2 - 4z - 25z + 10$

$2z(5z - 2) - 5(5z - 2)$

$(5z - 2)(2z - 5)$ Ans.

$10 \times 10 = 100$

$4 \times 25 = 100$

$3 \times 4 = 12$

12

$12 \times 1 = 12$

$12 + 1 = 13$

20) $-3y^2 + 13y - 4$

$-(3y^2 - 13y + 4)$

$-(3y^2 - 12y - y + 4)$

$-[3y(y - 4) - 1(y - 4)]$

$-[(y - 4)(3y - 1)]$

21) $x^2-21x+90$

$x^2-15x-6x+90$

$x(x-15)-6(x-15)$

$(x-15)(x-6)$ Ans.

22) x^2+x-2

$x^2+2x-1x-2$

$x(x+2)-1(x+2)$

$(x+2)(x-1)$ Ans.

23) ~~$3x^2+11x+6$~~ $3x^2+11x+6$

$3x^2+9x+2x+6$

$3x(x+3)+2(x+3)$

$(x+3)(3x+2)$ Ans.

24) $2x^2-5xy-3y^2$

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

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

$(x-3y)(2x+y)$ Ans.

25) $8+6x-5x^2$

$8+10x-4x-5x^2$

$2(4+5x)-x(4+5x)$

$(4+5x)(2-x)$ Ans.

26) $-5x^2-7x+6$

$-5x^2-(10x-3x)+6$

$-5x^2-10x+3x+6$

$-5x(x+2)+3(x+2)$

$(x+2)(-5x+3)$ Ans.

27) $2a^2-4a-6$

$2a^2-(6a-2a)-6$

$2a^2-6a+2a-6$

$2a(a-3)+2(a-3)$

$(a-3)(2a+2)$ Ans.

y^4-12y^2-64

$y^4-(16y^2-4y^2)-64$

$y^4-16y^2+4y^2-64$

$y^2(y^2-16)+4(y^2-16)$

$(y^2-16)(y^2+4)$ Ans.

28) u^4-13u^2+36

$u^4-(9u^2+4u^2)+36$

$u^4-9u^2-4u^2+36$

$u^2(u^2-9)-4(u^2-9)$

$(u^2-9)(u^2-4)$ Ans.