

## Exercise 2K

## Question 15:

$$(x + y - z) (x^2 + y^2 + z^2 - xy + yz + zx)$$

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

$$= x^3 + y^3 - z^3 + 3xyz.$$

## Question 16:

$$(x - 2y + 3) (x^2 + 4y^2 + 2xy - 3x + 6y + 9)$$

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

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

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

$$\text{Where, } x = a, (-2y) = b \text{ and } 3 = c$$

$$(x - 2y + 3) (x^2 + 4y^2 + 2xy - 3x + 6y + 9)$$

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

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

## Question 17:

$$\begin{aligned} &(x-2y-z)\,(x^2+4y^2+z^2+2xy+zx-2yz)\\ &= \left[x+(-2y)+(-z)\right]\left[(x)^2+(-2y)^2+(-z)^2-(x)\,(-2y)-(-2y)\,(-z)-(-z)\right.\\ &(x)\right]\\ &= (a+b+c)\,(a^2+b^2+c^2-ab-bc-ca)\\ &= a^3+b^3+c^3-3abc\\ &\text{Where } x=a,\,(-2y)=b\,\,\text{and}\,(-z)=c\\ &(x-2y-z)\,(x^2+4y^2+z^2+2xy+zx-2yz)\\ &= (x)^3+(-2y)^3+(-z)^3-3\,(x)\,(-2y)\,(-z)\\ &= x^3-8y^3-z^3-6xyz. \end{aligned}$$

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