Exercise 2K

Question 6:

$8a^3 + 125b^3 - 64c^3 + 120abc$

$= (2a)^3 + (5b)^3 + (-4c)^3 - 3\ (2a)\ (5b)\ (-4c)$

$= (2a + 5b - 4c)\ [(2a)^2 + (5b)^2 + (-4c)^2 - (2a)\ (5b) - (5b)\ (-4c) - (-4c)\ (2a)]$

$= (2a + 5b - 4c)\ (4a^2 + 25b^2 + 16c^2 - 10ab + 20bc + 8ca).$

Question 7:

$8 - 27b^3 - 343c^3 - 126bc$

$= (2)^3 + (-3b)^3 + (-7c)^3 - 3(2)\ (-3b)\ (-7c)$

$= (2 - 3b - 7c)\ [(2)^2 + (-3b)^2 + (-7c)^2 - (2)\ (-3b) - (-3b)\ (-7c) - (-7c)\ (2)]$

$= (2 - 3b - 7c)\ (4 + 9b^2 + 49c^2 + 6b - 21bc + 14c).$

Question 8:

$125 - 8x^3 - 27y^3 - 90xy$

$= (5)^3 + (-2x)^3 + (-3y)^3 - 3\ (5)\ (-2x)\ (-3y)$

$= (5 - 2x - 3y)\ [(5)^2 + (-2x)^2 + (-3y)^2 - (5)\ (-2x) - (-2x)\ (-3y) - (-3y)\ (5)]$

$= (5 - 2x - 3y)\ (25 + 4x^2 + 9y^2 + 10x - 6xy + 15y).$

Question 9:

$$2\sqrt{2}a^3 + 16\sqrt{2}b^3 + c^3 - 12abc$$

$$= \left(\sqrt{2}a\right)^3 + \left(2\sqrt{2}b\right)^3 + (c)^3 - 3\left(\sqrt{2}a\right)\left(2\sqrt{2}b\right)(c)$$

$$= \left(\sqrt{2}a + 2\sqrt{2}b + c\right)$$
$$\left[\left(\sqrt{2}a\right)^2 + \left(2\sqrt{2}b\right)^2 + c^2 - \left(\sqrt{2}a\right)\left(2\sqrt{2}b\right) - \left(2\sqrt{2}b\right)(c) - (c)\left(\sqrt{2}a\right)\right]$$

$$= \left(\sqrt{2}a + 2\sqrt{2}b + c\right)\left(2a^2 + 8b^2 + c^2 - 4ab - 2\sqrt{2}bc - \sqrt{2}ac\right).$$

Question 10:

$x^3 + y^3 - 12xy + 64$

$= x^3 + y^3 + 64 - 12xy$

$= (x)^3 + (y)^3 + (4)^3 - 3\ (x)\ (y)\ (4)$

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

$= (x + y + 4)\ (x^2 + y^2 + 16 - xy - 4y - 4x).$

********** END **********