Exercise 2J

Question 5:

$125a^3 + \frac{1}{8}$

We know that $a^3 + b^3 = (a+b)(a^2 - a \times b + b^2)$

Let us rewrite

$125a^3 + \frac{1}{8}$

$$= (5a)^3 + \left(\frac{1}{2}\right)^3$$
$$= \left(5a + \frac{1}{2}\right)\left[(5a)^2 - 5a \times \frac{1}{2} + \left(\frac{1}{2}\right)^2\right]$$
$$= \left(5a + \frac{1}{2}\right)\left(25a^2 - \frac{5a}{2} + \frac{1}{4}\right).$$

Question 6:

$216x^3 + \frac{1}{125}$

We know that $a^3 + b^3 = (a+b)(a^2 - a \times b + b^2)$

Let us rewrite

$216x^3 + \frac{1}{125}$

$$= (6x)^3 + \left(\frac{1}{5}\right)^3$$
$$= \left(6x + \frac{1}{5}\right)\left[(6x)^2 - 6x \times \frac{1}{5} + \left(\frac{1}{5}\right)^2\right]$$
$$= \left(6x + \frac{1}{5}\right)\left(36x^2 - \frac{6x}{5} + \frac{1}{25}\right).$$

Question 7:

$16x^4 + 54x$

$= 2x(8x^3 + 27)$

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

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

Since $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

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

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