



Exercise 2D

Question 5:

$$f(x) = 2x^3 + 9x^2 - 11x - 30$$

By the Factor Theorem, $(x + 5)$ will be a factor of $f(x)$ if $f(-5) = 0$.

$$\text{Here, } f(-5) = 2(-5)^3 + 9(-5)^2 - 11(-5) - 30$$

$$= -250 + 225 + 55 - 30$$

$$= -280 + 280 = 0$$

$\therefore (x + 5)$ is a factor of $(2x^3 + 9x^2 - 11x - 30)$.

Question 6:

$$f(x) = (2x^4 + x^3 - 8x^2 - x + 6)$$

By the Factor Theorem, $(x - a)$ will be a factor of $f(x)$ if $f(a) = 0$.

$$\text{Here, } 2x - 3 = 0 \Rightarrow x = 3/2$$

$$\therefore f\left(\frac{3}{2}\right) = 2\left(\frac{3}{2}\right)^4 + \left(\frac{3}{2}\right)^3 - 8\left(\frac{3}{2}\right)^2 - \left(\frac{3}{2}\right) + 6$$

$$= 2 \times \frac{81}{16} + \frac{27}{8} - 8 \times \frac{9}{4} - \frac{3}{2} + 6$$

$$= \frac{81}{8} + \frac{27}{8} - 18 - \frac{3}{2} + 6$$

$$= \frac{81 + 27 - 144 - 12 + 48}{8}$$

$$= \frac{156 - 156}{8} = 0$$

$\therefore (2x - 3)$ is a factor of $(2x^4 + x^3 - 8x^2 - x + 6)$.

Question 7:

$$f(x) = (7x^2 - 4\sqrt{2}x - 6 = 0)$$

By the Factor Theorem, $(x - a)$ will be a factor of $f(x)$ if $f(a) = 0$.

$$\text{Here, } f(\sqrt{2}) = 7(\sqrt{2})^2 - 4\sqrt{2} \times \sqrt{2} - 6$$

$$= 14 - 8 - 6$$

$$= 14 - 14 = 0$$

$\therefore (x - \sqrt{2})$ is a factor of $(7 - 4\sqrt{2}x - 6 = 0)$.

***** END *****