Exercise 2D

Question 8:

$f(x) = (4\sqrt{2}x^2 + 5x + \sqrt{2} = 0)$

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

Here,

$$f(-\sqrt{2}) = 2\sqrt{2}(-\sqrt{2})^2 + 5(-\sqrt{2}) + \sqrt{2}$$
$$= 2\sqrt{2} \times 2 - 5\sqrt{2} + \sqrt{2}$$
$$= 4\sqrt{2} - 5\sqrt{2} + \sqrt{2}$$
$$= 5\sqrt{2} - 5\sqrt{2} = 0.$$

$\therefore (x + \sqrt{2})$ is a factor of $(4\sqrt{2}x^2 + 5x + \sqrt{2} = 0)$.

Question 9:

$f(x) = (2x^3 + 9x^2 + x + k)$

$x - 1 = 0 \Rightarrow x = 1$

$\therefore f(1) = 2 \times 1^3 + 9 \times 1^2 + 1 + k$

$= 2 + 9 + 1 + k$

$= 12 + k$

Given that $(x - 1)$ is a factor of $f(x)$.

By the Factor Theorem, $(x - a)$ will be a factor of $f(x)$ if $f(a) = 0$ and therefore $f(1) = 0$.

$\Rightarrow f(1) = 12 + k = 0$

$\Rightarrow k = -12$.

Question 10:

$f(x) = (2x^3 - 3x^2 - 18x + a)$

$x - 4 = 0 \Rightarrow x = 4$

$\therefore f(4) = 2(4)^3 - 3(4)^2 - 18 \times 4 + a$

$= 128 - 48 - 72 + a$

$= 128 - 120 + a$

$= 8 + a$

Given that $(x - 4)$ is a factor of $f(x)$.

By the Factor Theorem, $(x - a)$ will be a factor of $f(x)$ if $f(a) = 0$ and therefore $f(4) = 0$.

$\Rightarrow f(4) = 8 + a = 0$

$\Rightarrow a = -8$

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