

(17) i) let $p(x) = 3x^2 + 6x - 24$

$$p(2) = 3 \times 2^2 + 6 \times 2 - 24$$

$$= 12 + 12 - 24$$

$$= 0$$

$\therefore x-2$ is a factor of $p(x)$

17 ii) let $f(x) = 4x^2 + x - 2$

$$f(2) = 4 \times 2^2 + 2 - 2$$

$$= 16$$

$\neq 0$
 $\therefore x-2$ is not a factor of $f(x)$

18 i) let $f(x) = x^{10} - 1$

$$f(1) = 1^{10} - 1$$

$$= 1 - 1$$

$$= 0$$

$\therefore x-1$ is a factor of $f(x)$

ii) let $g(x) = x^{11} - 1$

$$g(1) = 1^{11} - 1$$

$$= 1 - 1$$

$$= 0$$

$x-1$ is a factor of $g(x)$

(19) let $p(x) = x^3 - 2mx^2 + 16$

$$g(x) = x + 2$$

$p(x)$ is div. by $g(x)$

$\therefore p(-2) = 0$

$$(-2)^3 - 2m(-2)^2 + 16 = 0$$

$$-8 - 8m + 16 = 0 \quad | \Rightarrow m = 1$$

$$-8m = -8$$

(20)

$$\text{let } p(x) = x^5 - 4a^2x^3 + 2x + 2a + 3$$

$x+2a$ is a factor of $p(x)$

$\therefore p(-2a) = 0$

$$(-2a)^5 - 4a^2(-2a)^3 + 2(-2a) + 2a + 3 = 0$$

$$\Rightarrow -32a^5 + 32a^5 - 4a + 2a + 3 = 0$$

$$\Rightarrow -2a = -3$$

$$\Rightarrow a = \frac{3}{2}$$

(21) let $p(x) = 8x^4 + 4x^3 - 16x^2 + 10x + m$

$2x-1$ is a factor of $p(x)$

$\therefore p\left(\frac{1}{2}\right) = 0$

$$8 \times \left(\frac{1}{2}\right)^4 + 4 \times \left(\frac{1}{2}\right)^3 - 16 \times \left(\frac{1}{2}\right)^2 + 10 \times \frac{1}{2} + m = 0$$

$$\Rightarrow \frac{8}{16} + \frac{4}{8} - \frac{16}{4} + \frac{10}{2} + m = 0$$

$$\Rightarrow \frac{1+1}{2} - 4 + 5 + m = 0$$

$$\Rightarrow \frac{2}{2} + 1 + m = 0$$

$$\Rightarrow m = -2$$