Exercise 2.3

Question 17:

Determine which of the following polynomials has $x - 2$ a factor:

(i) $3x^2 + 6x - 24$. **(ii)** $4x^2 + x - 2$.

Answer 17:

(i). We have $p(x) = 3x^2 + 6x - 24$, $g(x) = x - 2$

Put $g(x) = 0$

$\Rightarrow x - 2 = 0$

$\Rightarrow x = 2$

According to factor theorem if $g(x)$ is a factor of $p(x)$, the remainder $p(2)$ should be zero.

Remainder $= p(2)$

$= 3(2)^2 + 6(2) - 24$

$= 12 + 12 - 24$

$= 24 - 24 = 0$

$\Rightarrow g(x)$ is a factor of $p(x)$.

(ii). We have $p(x) = 4x^2 + x - 2$, $g(x) = x - 2$

Put $g(x) = 0$

$\Rightarrow x - 2 = 0$

$\Rightarrow x = 2$

According to factor theorem if $q(x)$ is a factor of $p(x)$, the remainder $p(2)$ should be zero.

Remainder $= p(2)$

$= 4(2)^2 + (2) - 2$

$= 16 + 2 - 2$

$= 16 \neq 0$

$\Rightarrow g(x)$ is not a factor of $p(x)$.