



2(ii) $g(x) = x^2 + 3x + 1$

$p(x) = 3x^4 + 5x^3 - 7x^2 + 2x + 2$

$$\begin{array}{r}
 3x^2 - 4x + 2 \\
 x^2 + 3x + 1 \overline{) 3x^4 + 5x^3 - 7x^2 + 2x + 2} \\
 \underline{3x^4 + 9x^3 + 3x^2} \\
 -4x^3 - 10x^2 + 2x + 2 \\
 \underline{-4x^3 - 12x^2 - 4x} \\
 2x^2 + 6x + 2 \\
 \underline{2x^2 + 6x + 2} \\
 0
 \end{array}$$

∴ remainder = 0

∴ $g(x)$ is a factor of $p(x)$

2(iii) $g(x) = x^3 - 3x + 1$

$p(x) = x^5 - 4x^3 + x^2 + 3x + 1$

$$\begin{array}{r}
 x^2 - 1 \\
 x^3 - 3x + 1 \overline{) x^5 - 4x^3 + x^2 + 3x + 1} \\
 \underline{x^5 - 3x^3 + x^2} \\
 -x^3 + 3x + 1 \\
 \underline{-x^3 + 3x - 1} \\
 2
 \end{array}$$

∴ remainder $\neq 0$

∴ $g(x)$ is not a factor of $p(x)$