ex 2.3 ix exemplar

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

(15) $g(x) = x - 2$

$p(2) = 2^3 - 5\times 2^2 + 4\times 2 - 3$

$= 8 - 20 + 8 - 3$

$= 16 - 23$

$= -7$

$\neq 0$

$p(x)$ is not a multiple of $g(x)$

(ii) $p(x) = 2x^3 - 11x^2 - 4x + 5$

$g(x) = 2x + 1$

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

$2\times\left(-\frac{1}{2}\right)^3 - 11\times\left(-\frac{1}{2}\right)^2 - 4\left(-\frac{1}{2}\right) + 5$

$= 2\times -\frac{1}{8} - 11\times\frac{1}{4} + \frac{4}{2} + 5$

$= -\frac{1}{4} - \frac{11}{4} + 2 + 5$

$= \frac{-1 - 11 + 28}{4}$

$= \frac{16}{4}$

$= 4$

$\neq 0$

$p(x)$ is not a multiple of $g(x)$

(16) i

let $p(x) = x^3 - x^2 + 11x + 69$

$g(x) = x + 3$

$p(-3) = (-3)^3 - (-3)^2 + 11(-3) + 69$

$= -27 - 9 - 33 + 69$

$= -69 + 69$

$= 0$

$\therefore x + 3$ is a factor of $p(x)$ by factor theorem

16 (ii)

let $p(x) = 2x^3 - 9x^2 + x + 12$

$g(x) = 2x - 3$

$p\left(\frac{3}{2}\right) = 2\times\left(\frac{3}{2}\right)^2 - 9\left(\frac{3}{2}\right)^2 + \frac{3}{2} + 12$

$= 2\times\frac{27}{8} - 9\times\frac{9}{4} + \frac{3}{2} + 12$

$= \frac{27 - 81 + 6 + 48}{4}$

$= \frac{81 - 81}{4}$

$= 0$

$\therefore 2x - 3$ is a factor of $p(x)$ by factor theorem