



Exercise 2B

Question 3:

$$\begin{aligned}\text{Required polynomial} &= [x - (-2)] [x - (-3)] [x - (-1)] \\&= (x + 2)(x + 3)(x + 1) \\&= (x^2 + 5x + 6)(x + 1) \\&= x^3 + x^2 + 5x^2 + 5x + 6x + 6 \\&= x^3 + 6x^2 + 11x + 6\end{aligned}$$

Question 4:

Required Polynomial

$$\begin{aligned}&= (x - 3) \left(x - \frac{1}{2} \right) [(x - (-1))] = (x - 3) \left(x - \frac{1}{2} \right) (x + 1) \\&= (x - 3)(x + 1) \left(x - \frac{1}{2} \right) = (x^2 - 2x - 3) \left(x - \frac{1}{2} \right) \\&= \frac{2x^3 - 4x^2 - 6x - x^2 + 2x + 3}{2} = p(x) \\p(x) &= \frac{2x^3 - 4x^2 - 6x - x^2 + 2x + 3}{2} \\p(x) &= \frac{1}{2}(2x^3 - 5x^2 - 4x + 3)\end{aligned}$$

Hence, required polynomial is $(2x^3 - 5x^2 - 4x + 3)$

Question 5:

$$f(x) = 4x^3 - 8x^2 + 8x + 1$$

$$q(x) = (2x - 1)$$

$$r(x) = (x + 3)$$

By division algorithm, we have

$$\text{Dividend} = (\text{Quotient} \times \text{Divisor}) + \text{Remainder}$$

$$f(x) = q(x) \times g(x) + r(x)$$

$$(4x^3 - 8x^2 + 8x + 1) = (2x - 1) \times g(x) + (x + 3)$$

$$\begin{aligned}g(x) &= \frac{(4x^3 - 8x^2 + 8x + 1) - (x + 3)}{(2x - 1)} \\&= \frac{4x^3 - 8x^2 + 7x - 2}{2x - 1} = 2x^2 - 3x + 2\end{aligned}$$

$$\begin{array}{r}
 2x^2 - 3x + 2 \\
 2x - 1 \overline{) 4x^3 - 8x^2 + 7x - 2} \\
 \underline{4x^3 - 2x^2} \\
 (-) (+) \\
 -6x^2 + 7x \\
 \underline{-6x^2 + 3x} \\
 (+) (-) \\
 4x - 2 \\
 \underline{4x - 2} \\
 (-) (+) \\
 0
 \end{array}$$

***** END *****