

4th exercise:

$$p(x) = 3x^2 - 2x - 40$$

$$\begin{aligned} \Rightarrow p(-3) &= 3(-3)^2 - 2(-3) - 40 \\ &= 27 + 6 - 40 \end{aligned}$$

$$\boxed{p(-3) = -7}$$

$$p\left(\frac{11}{3}\right) = 3\left(\frac{11}{3}\right)^2 - 2\left(\frac{11}{3}\right) - 40$$

$$= \frac{121}{3} - \frac{22}{3} - 40$$

$$= \frac{99}{3} - 40$$

$$\boxed{p\left(\frac{11}{3}\right) = -7}$$

Thus, $p\left(\frac{11}{3}\right) = p(-3)$

$$\begin{aligned} \textcircled{x} \quad 2a) \quad (x+3)(3x-1) &= 3x^2 - 11x + 9x - 33 \\ &= 3x^2 - 2x - 33 \end{aligned}$$

$$\Rightarrow p(x) = 7$$

$$\textcircled{x} \quad 3x^2 - 2x - 40 = 7$$

$$3x^2 - 2x - 33 = 0$$

$$\textcircled{x} \quad \text{so, } (x+3)(3x-1) = 0$$

$$\textcircled{x} \quad \text{means } x = -3 \text{ or } x = \frac{11}{3}$$

$$3a) \quad Q(x) = (m+nx)(x-3) + p$$

$$\textcircled{x} \quad = \underline{m}x - \underline{3m} + \underline{nx^2} - \underline{3nx} + \underline{p}$$

$$\textcircled{x} \quad Q(x) = nx^2 + (m-3n)x - 3m + p$$

$$\Rightarrow p(x) = Q(x) \text{ (given)}$$