

4.3

Q7a

Q8a

$$f(x) = \frac{3x^2 - 2x - 17}{x - 3}$$
$$= 3x + 7 + \frac{4}{x - 3}$$

$$\begin{array}{r|rrrr} 3 & 3 & -2 & -17 & \\ & & 9 & 21 & \\ \hline & 3 & 7 & 4 & \end{array}$$

$$\therefore \text{oa @ } y = 3x + 7$$

$$\text{and } \lim_{x \rightarrow \infty} f(x) = (3x + 7)^+$$

$$\lim_{x \rightarrow -\infty} f(x) = (3x + 7)^-$$

7b
8b

$$f(x) = \frac{2x^2 + 9x + 2}{2x + 3}$$
$$= x + 3 - \frac{7}{2x + 3}$$

$$\begin{array}{r} x + 3 \\ 2x + 3 \overline{) 2x^2 + 9x + 2} \\ \underline{2x^2 + 3x} \downarrow \\ 6x + 2 \\ \underline{6x + 9} \\ -7 \end{array}$$

$$\therefore \text{oa @ } y = x + 3$$

$$\text{and } \lim_{x \rightarrow \infty} f(x) = (x + 3)^-$$

$$\lim_{x \rightarrow -\infty} f(x) = (x + 3)^+$$

7c)

$$f(x) = \frac{x^3 - 1}{x^2 + 2x}$$

$$= x - 2 + \frac{4x - 1}{x^2 + 2x}$$

\therefore oa @ $y = x - 2$.

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

7d)

$$f(x) = \frac{x^3 - x^2 - 9x + 15}{x^2 - 4x + 3}$$

$$= x + 3 + \frac{6}{x^2 - 4x + 3}$$

\therefore oa @ $y = x + 3$.

$$x^2 - 4x + 3 \overline{) \begin{array}{r} x + 3 \\ x^3 - x^2 - 9x + 15 \\ \underline{x^3 - 4x^2 + 3x} \downarrow \\ 3x^2 - 12x + 15 \\ \underline{3x^2 - 12x + 9} \\ 6 \end{array}}$$