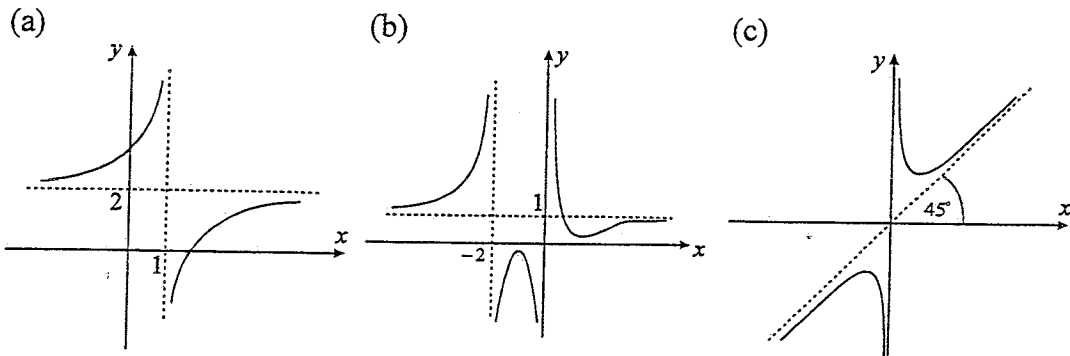# EXERCISE 10H

ASYMPTOTES

1. State all asymptotes for the functions graphed below.

(a)   (b)   (c)

2. Find any asymptotes for the following rational functions:

(a) $y = \dfrac{1}{x+3}$ (b) $y = \dfrac{7}{1-x}$ (c) $y = \dfrac{3}{5x+1}$

(d) $y = \dfrac{x-2}{x-3}$ (e) $y = \dfrac{3x-1}{x+4}$ (f) $y = \dfrac{7x+3}{4x-5}$

(g) $y = x + \dfrac{1}{x}$ (h) $y = 2 - \dfrac{1}{x+1}$ (i) $y = 3x - \dfrac{2}{x+2}$

3. Find any asymptotes for the following rational functions

(a) $y = \dfrac{7}{x^2-1}$ (b) $y = \dfrac{x}{x^2+x}$ (c) $y = \dfrac{x^2-2x+3}{x}$

(d) $y = \dfrac{x+1}{x^2+1}$ (e) $y = \dfrac{3x^2+1}{x^2-4}$ (f) $y = \dfrac{5x^2}{x^2-2x+1}$

ANSWERS

1. (a)   H.A. $y = 2$, V.A. $x = 1$
    (b)   H.A. $y = 1$, V.A. $x = -2$ & $x = 0$ (y-axis)
    (c)   O.A. $y = x$, V.A. $x = 0$ (y-axis)

2. (a)   H.A. $y = 0$ (x-axis), V.A. $x = -3$
    (b)   H.A. $y = 0$ (x-axis), V.A. $x = 1$
    (c)   H.A. $y = 0$ (x-axis), V.A. $x = -\dfrac{1}{5}$
    (d)   H.A. $y = 1$, V.A. $x = 3$
    (e)   H.A. $y = 3$, V.A. $x = -4$
    (f)   H.A. $y = \dfrac{7}{4}$, V.A. $x = \dfrac{5}{4}$
    (g)   O.A. $y = x$, V.A. $x = 0$ (y-axis)
    (h)   H.A. $y = 2$, V.A. $x = -1$
    (i)   O.A. $y = 3x$, V.A. $x = -2$

3. (a)   H.A. $y = 0$ (x-axis), V.A. $x = 1$ & $x = -1$
    (b)   H.A. $y = 0$ (x-axis), V.A. $x = -1$
    (c)   O.A. $y = x - 2$, V.A. $x = 0$ (y-axis)
    (d)   H.A. $y = 0$ (x-axis)
    (e)   H.A. $y = 3$, V.A. $x = 2$ & $x = -2$
    (f)   H.A. $y = 5$, V.A. $x = 1$