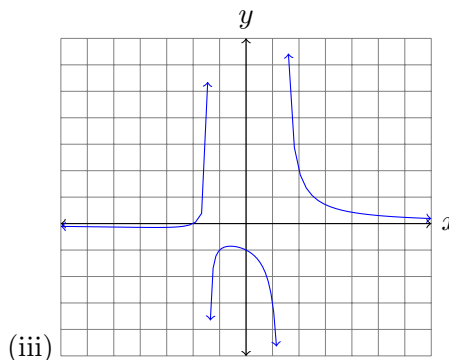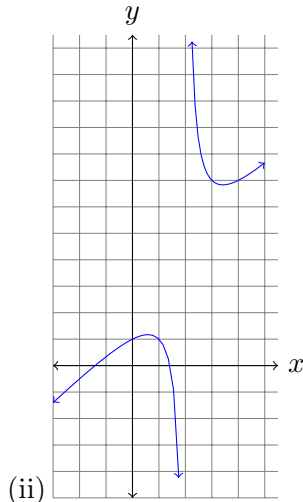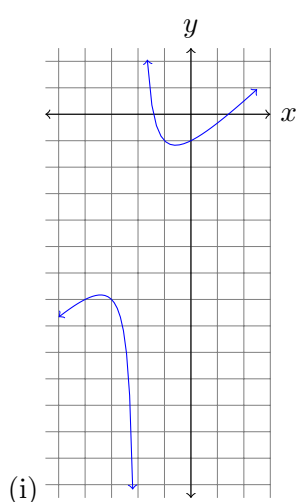(1) Given $f(x) = \frac{x^2-2}{x+2}$,

(a) List the domain and the x and y intercepts.

Solution:$(-\infty, -2) \cup (-2, \infty)$; $(-\sqrt{2}, 0)$ and $(\sqrt{2}, 0)$; $(0, -1)$

(b) Determine the vertical, horizontal, and oblique asymptotes.

Solution: vertical asymptote, $x = -2$; since the degree of the numerator is greater than the degree of the denominator there is no horizontal and no oblique asymptotes.

(c) Which of the following is the graph of $f(x)$?

(i)   (ii)   (iii)
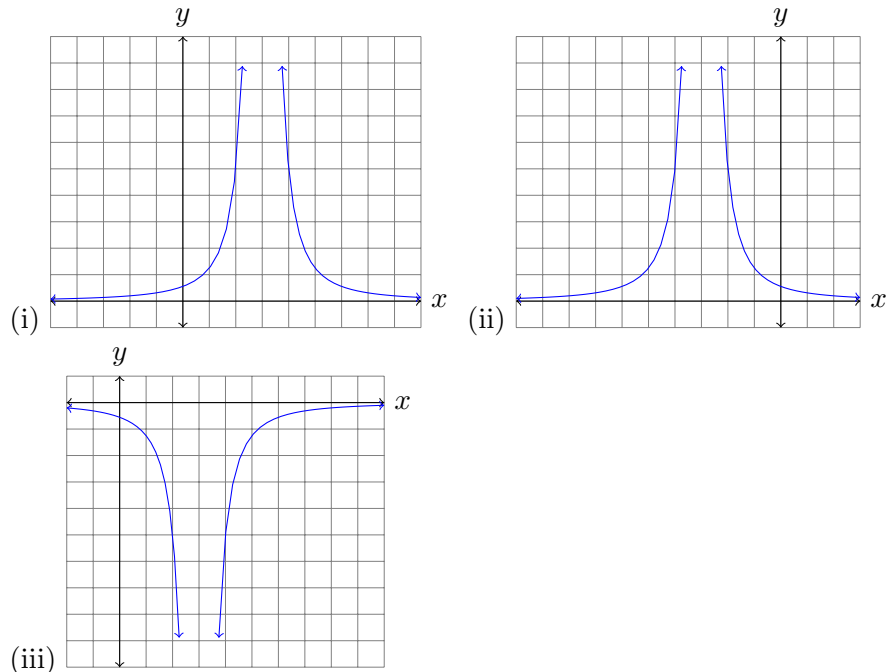
Solution: (i)

(2) Given $f(x) = \frac{5}{(x-3)^2}$,

(a) List the domain and the x and y intercepts.

Solution: $(-\infty, 3) \cup (3, \infty)$; none; $(0, \frac{5}{9})$

(b) Determine the vertical, horizontal, and oblique asymptotes.

Solution: vertical asymptote, $x = 3$, horizontal asymptote, $y = 0$, oblique asymptote, none.

(c) Which of the following is the graph of $f(x)$?

(i)

(ii)

(iii)

Solution: (i)

(3) Given $f(x) = \frac{x^2+x-2}{x^2+x-6}$,
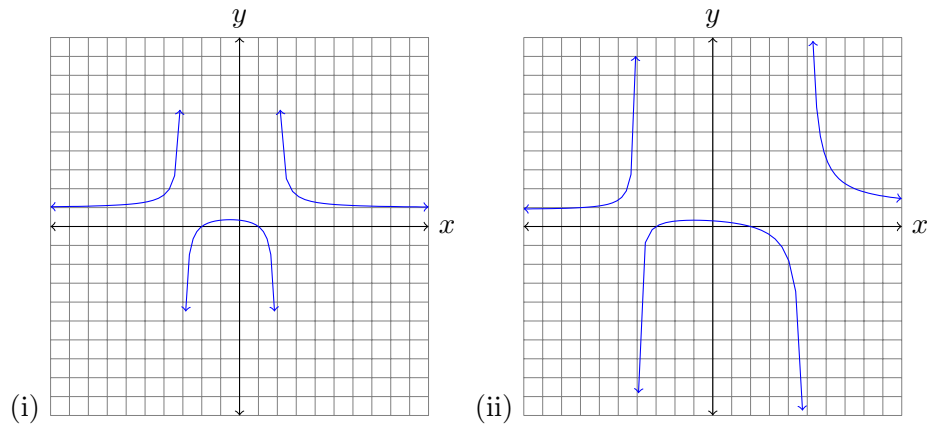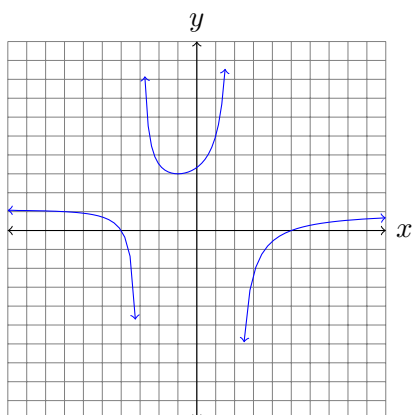
(a) List the domain and the x and y intercepts.

Solution: $(-\infty, -3) \cup (-3, 2) \cup (2, \infty)$; (-2,0), (1,0); $(0, \frac{1}{3})$

(b) Determine the vertical, horizontal, and oblique asymptotes.

Solution: $x = -3$ and $x = 2$; $y = 1$; none.

(c) Which of the following is the graph of $f(x)$?

(i)

(ii)

(iii)
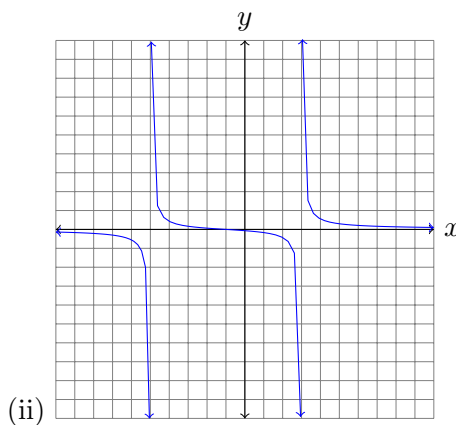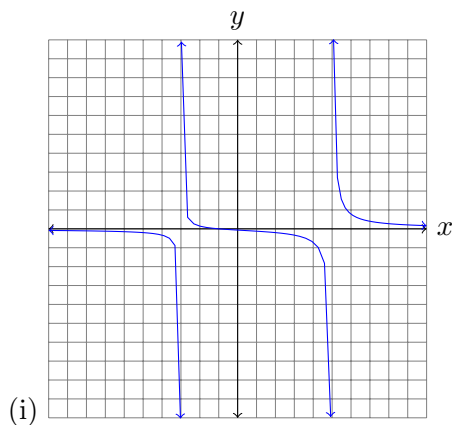
Solution: (i)

(4) Given $f(x) = \frac{x+1}{x^2-2x-15}$,
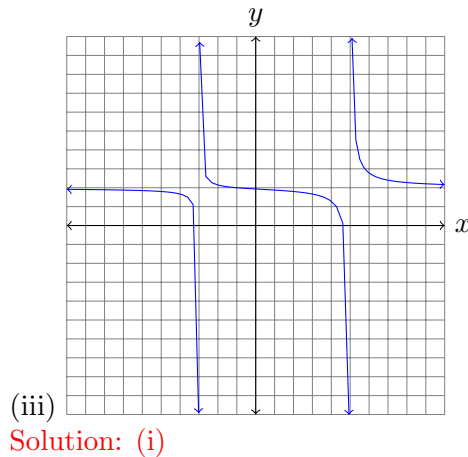
(a) List the domain and the x and y intercepts.

Solution: $(-\infty, -3) \cup (-3, 5) \cup (5, \infty)$; (-1,0); $(0, \frac{-1}{15})$

(b) Determine the vertical, horizontal, and oblique asymptotes.

Solution: $x = 5$ and $x = -3$; $y = 0$; none.

(c) Which of the following is the graph of $f(x)$?

(i)

(ii)

(iii)

Solution: (i)

(5) Which of the following functions has the vertical asymptotes, x=-2, and x=1?

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

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

(c) $f(x) = x^2 + x - 2$

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

Solution: (a)

(6) Which of the following functions has the vertical asymptotes, $x = -1$, and $x = 3$; horizontal asymptote, $y = 2$; and x-intercept $(-3, 0)$?

(a) $f(x) = \frac{2x^2+6x}{x^2-2x-3}$

(b) $f(x) = \frac{x^2-2x-3}{2x^2+6x}$

(c) $f(x) = x^2 - 2x - 3$

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

Solution: (a)

(7) Which of the following is the domain of the function,

$$h(x) = \frac{x^2 + 2x - 3}{x^2 - 7x + 10}$$

(a) $(-\infty, 2) \cup (2, 5) \cup (5, \infty)$

(b) $(-\infty, -2) \cup (-2, 5) \cup (5, \infty)$

(c) $(-\infty, -3) \cup (-3, 1) \cup (1, \infty)$

(d) $(-\infty, 1) \cup (1, 3) \cup (3, \infty)$

Solution: (a)

(8) Which of the following lists the vertical asymptotes of the function
$$g(x) = \frac{x - 1}{(x - 1)(x - 2)(x + 4)}$$

(a) $x = -4, x = 2$
(b) $x = -4, x = 1, x = 2$
(c) $x = -2, x = -1, x = 4$
(d) $x = 1$
Solution: (a)