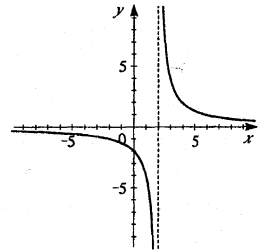


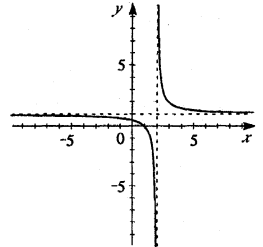
19. $r(x) = \frac{4}{x-2}$. When $x = 0$, $r(0) = \frac{4}{0-2} = -2$, and so the y -intercept is -2 .

Since the numerator can never be zero, there is no x -intercept. Since the degree of the numerator is less than the degree of the denominator, the horizontal asymptote is $y = 0$. There is a vertical asymptote when $x - 2 = 0 \Leftrightarrow x = 2$.



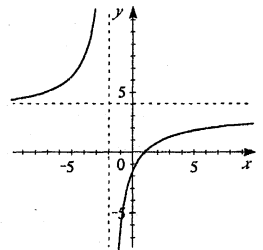
21. $r(x) = \frac{x-1}{x-2}$. When $x = 0$, $y = \frac{1}{2}$, so the y -intercept is $\frac{1}{2}$. When $y = 0$, $x - 1 = 0 \Leftrightarrow x = 1$,

so the x -intercept is 1 . Since the degree of the numerator and denominator are the same the horizontal asymptote is $y = \frac{1}{1} = 1$. A vertical asymptote occurs when $x - 2 = 0 \Leftrightarrow x = 2$.

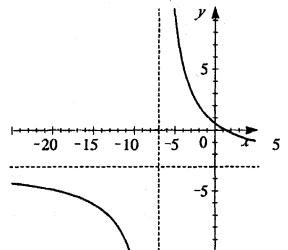


23. $y = \frac{4x-4}{x+2}$. When $x = 0$, $y = -2$, so the y -intercept is -2 . When $y = 0$, $4x - 4 = 0 \Leftrightarrow$

$x = 1$, so the x -intercept is 1 . Since the degree of the numerator and denominator are the same the horizontal asymptote is $y = \frac{4}{1} = 4$. A vertical asymptote occurs when $x = -2$.



25. $s(x) = \frac{4-3x}{x+7}$. When $x = 0$, $y = \frac{4}{7}$, so the y -intercept is $\frac{4}{7}$. The x -intercepts occur when $y = 0 \Leftrightarrow 4 - 3x = 0 \Leftrightarrow x = \frac{4}{3}$. A vertical asymptote occurs when $x = -7$. Since the degree of the numerator and denominator are the same the horizontal asymptote is $y = \frac{-3}{1} = -3$.



27. $r(x) = \frac{18}{(x-3)^2}$. When $x = 0$, $y = \frac{18}{9} = 2$, and so the y -intercept is 2 . Since the numerator can never be zero, there is no x -intercept. There is a vertical asymptote when $x - 3 = 0 \Leftrightarrow x = 3$, and because the degree of the asymptote is $y = 0$.

