

Trig 3.7

Graph rational functions

Determine horizontal, vertical, slant asymptotes

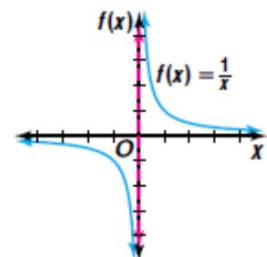
rational function $y=1/x$

vertical asymptote

horizontal asymptote

point discontinuity

slant asymptote



$$x+4=0$$

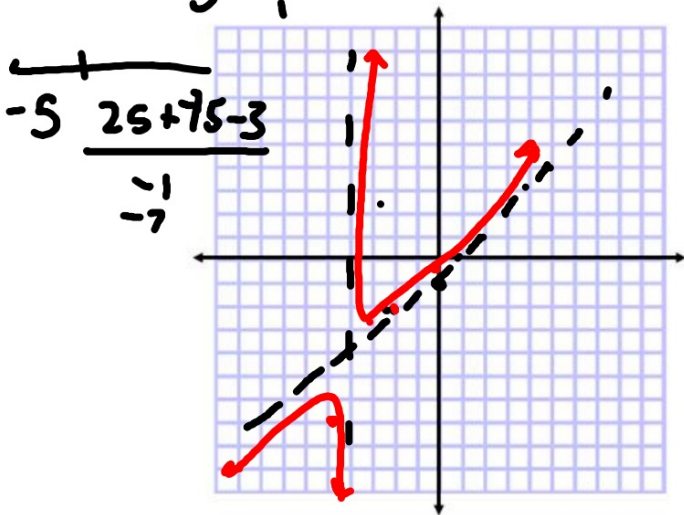
$$\begin{matrix} -4 & -4 \end{matrix}$$

Determine the slant asymptote of each function.

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

VA $x = -4$

SA $y = \frac{1}{2}x - 1$



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

$$\begin{array}{r} (x-1) \\ \hline x+4 \overline{) x^2 + 3x - 3} \\ - x^2 + 4x \\ \hline -x - 3 \\ + x + 4 \\ \hline 1 \\ \hline x^2 + 3x - 3 \\ \hline x + 4 \end{array}$$

Graph each function.

35. $y = \frac{(x-2)(x+1)}{x}$

$x-2=0$

$x=2$

$x+1=0$

$x=-1$

$x-1$

$x=-1$

$$x \sqrt{\frac{x^2 - x - 2}{-x^2}}$$

$$\frac{x^2}{x}$$

$$\nearrow -x$$

$$y=x \searrow$$

VA $x=0$

~~HA~~

SA

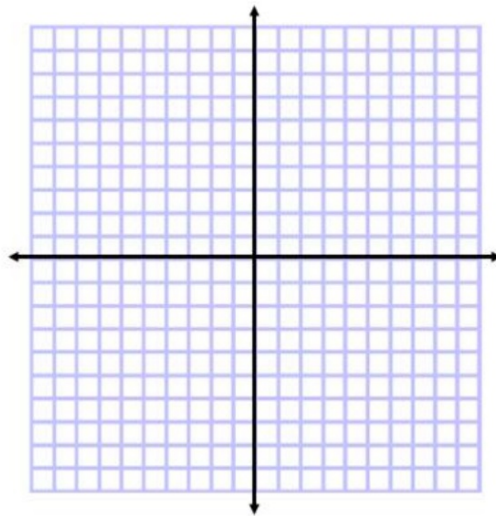
zeros

end behavior

$y = x - 1$

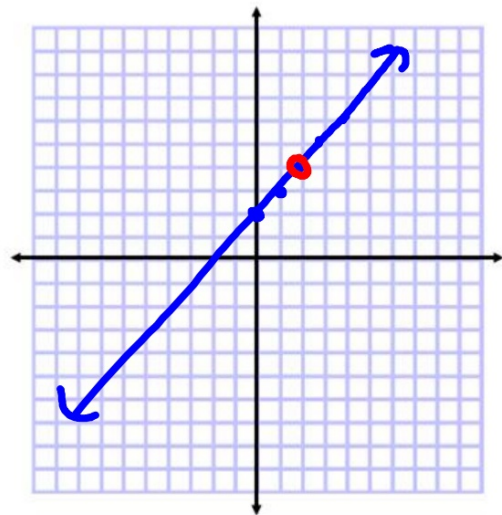
$x = 2$

$x = -1$



$$36. y = \frac{(x+2)(\cancel{x-2})}{(x-2)}$$

$$y = x + 2$$



$$39. y = \frac{x^2 - 6x + 9}{x^2 - x - 6}$$

$(x-3)(x-3)$
 $(x-3)(x+2)$

$$y = \frac{x-3}{x+2}$$

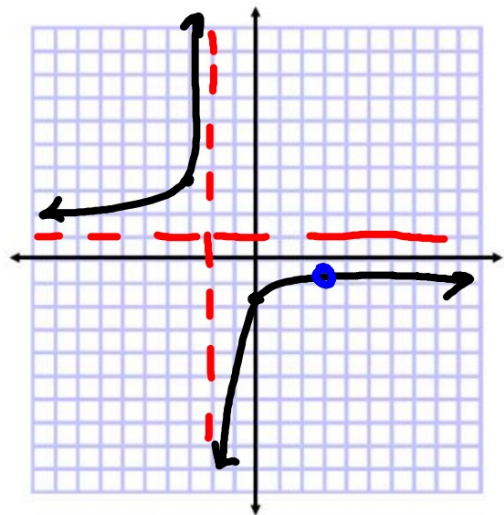
| | |
|----|----------------|
| 0 | $-\frac{3}{2}$ |
| -4 | $-\frac{7}{2}$ |

* P.D. $x=3$

HA $y=1$

VA $x=-2$

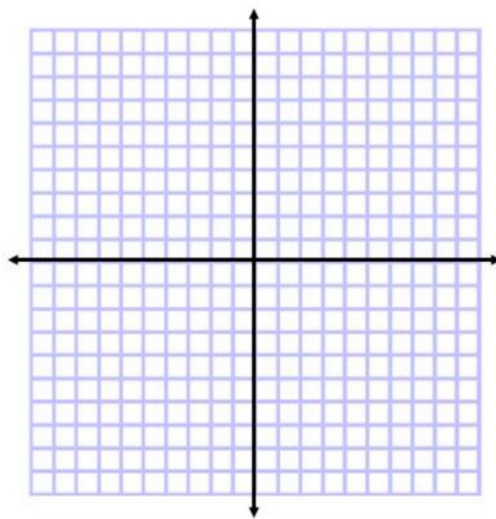
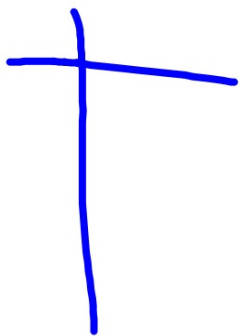
factor



5 Graph $y = \frac{(x+3)(x+1)}{x(x+3)(x-2)}$

$$\frac{x+1}{x(x-2)}$$

PD $x = -3$
VA $x = 0$
HA $y = 0$
~~SA~~
zeros $x = -1$
end behavior



WB 3.7