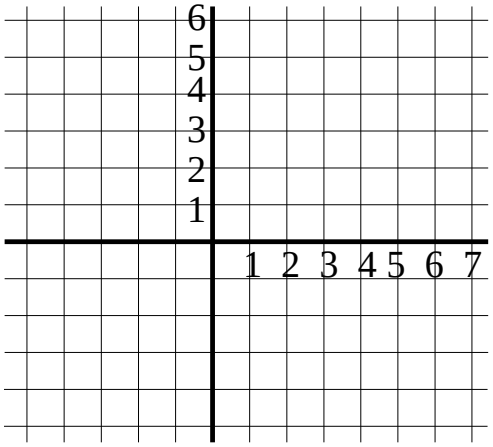
Vertical asymptotes occur when

Horizontal asymptotes occur when

Give an example of a function with two vertical asymptotes

Give an example of a function with a horizontal asymptote.

Draw the graph of a function with the following properties:
domain $= (-5, \infty)$, range $= (-4, \infty)$
f is continuous everywhere except at 0, 5
f is differentiable everywhere except at 0, 5, 7
$f(0) = 4$, $f'(x) = \frac{2}{3}$ if $x \in \{-1\} \cup [2, 4]$
$f'(1) = 0$, $f'(x) < 0$ if $x < -3$.



Calculate the following limit. Show all steps.

$$lim_{x \to -\infty} \frac{x - 1}{\sqrt{2 - 3x^2}}$$

Express the given quantity as a single log: $3ln(2x) - ln(x + 1) + ln(10x^2)$

Find the exact value of $ln(\sqrt{e}) + ln(3e) - ln(3)$

FYI: derive quotient rule from product and chain rule:

$$\left(\frac{f}{g}\right)' = (fg^{-1})' = f'g^{-1} - fg^{-2}g' = \frac{f'g - fg'}{g^2}$$