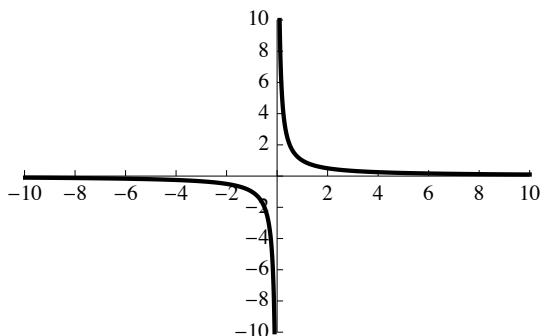
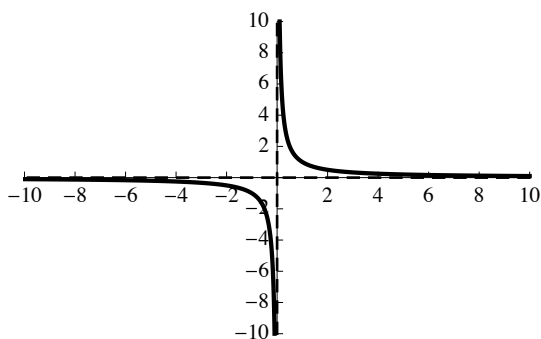


Horizontal Asymptotes

In the previous set of notes, we saw a very special behavior of a graph: as the x values got closer and closer to $+\infty$, the y values got closer and closer to 0, and as the x values got closer and closer to $-\infty$, the y values got closer and closer to 0. Here is that graph, again:



To highlight this behavior, mathematicians draw a horizontal dashed line to indicate that the graph approaches this line:



A horizontal line (that a function approaches) has its own special name: a *horizontal asymptote*.

And this horizontal asymptote, since it is a horizontal line, has an equation:

$$y = 0$$

Here is an example of a function with a horizontal asymptote at $y = 4$ and a vertical asymptote at $x = 2$:

