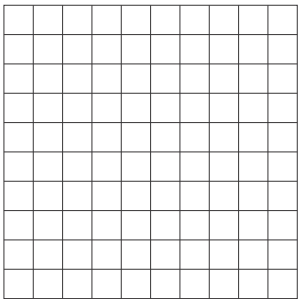
4-2 Additional Practice

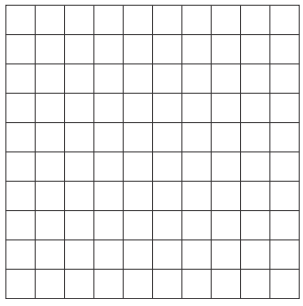
Graphing Rational Functions

Use long division to rewrite each rational function. Sketch the graph and identify the asymptotes.

1. $f(x) = \frac{2x}{x + 1}$



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



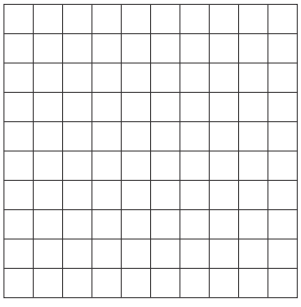
Identify the vertical and horizontal asymptotes of each rational function.

3. $f(x) = \frac{2x^2}{4x^2 - 1}$

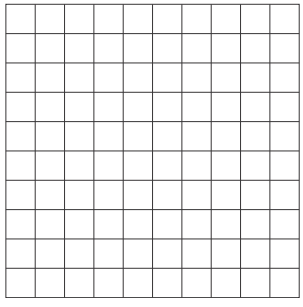
4. $f(x) = \frac{2x^2 + 10x + 12}{x^2 - 9}$

Graph each function. Label all the horizontal and vertical asymptotes.

5. $f(x) = \frac{10x + 20}{10x^2 - 49x - 33}$



6. $f(x) = \frac{x^2 - 4x - 6}{2x^2 - 10x - 12}$



7. You start a business typing papers for students and spend $3,500 on a computer and office furniture. You estimate additional costs at $0.02 per page. Write a rational function to model the total average cost per page for the first year.

8. The graph of a rational function has vertical asymptotes at $x = -3$ and $x = 3$ and a horizontal asymptote at $y = 1$. Write a function that has those attributes. Then graph the function to verify that it is correct.