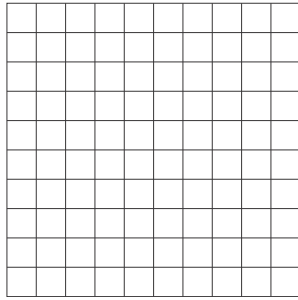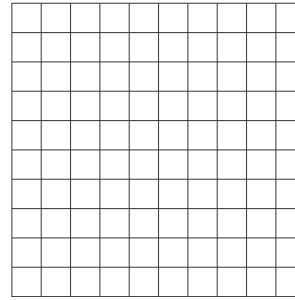# 4-2 Additional Practice

Graphing Rational Functions

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

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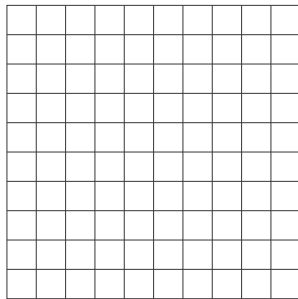
2. $f(x) = \dfrac{2x^2}{x^2-1}$

Identify the vertical and horizontal asymptotes of each rational function.
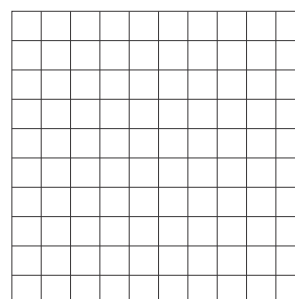
3. $f(x) = \dfrac{2x^2}{4x^2-1}$

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

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

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

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

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.