Math 109—Rational Function

I. **Domain & Vertical Asymptotes**

A. State the domain of each rational function.

B. Give the equation of the vertical asymptote(s) of the rational function.

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

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

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

4. $f(x) = \frac{3x^2}{x^2-4x-12}$

II. **Graphs & Range**

A. Match each rational function with its graph.

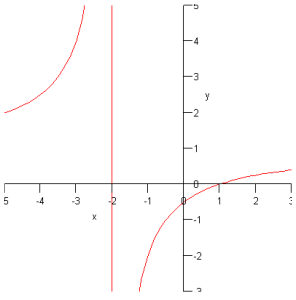
B. State the range for each rational function.

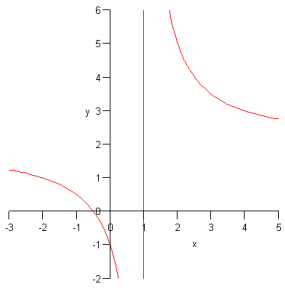
C. Find each of the horizontal asymptotes.

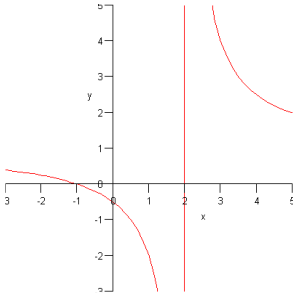
5. $f(x) = \frac{2x+1}{x-1}$

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

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







III. **Graph and find all of the important parts**

A. Find the horizontal and vertical asymptote for each rational function (using limits as appropriate).

B. Sketch the graph of each rational function.

C. Find the domain and range.

8. $f(x) = \frac{1}{x+6}$

9. $f(x) = \frac{2x}{x-3}$

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

11. $f(x) = \frac{x^2+5}{2x^2-x-1}$

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