**Math 11 Worksheet**   Name _____

Answer all questions on a separate sheet, or sheets.

1. A soda manufacturer wants to make a cylindrical aluminum can out of 280 square
   centimeters of aluminum.
   a) What is the maximum volume that can be achieved?
   b) The marketing department would prefer a tall, thin can. What is the maximum height of a
   can that has 90% of the maximum volume?

2. Given the graph of $f(x)$ below, sketch the graph of $\dfrac{1}{f(x)}$. Determine the equations of any
   asymptotes and sketch them, and give the domain and range of the reciprocal function. (Do
   your best to estimate the zeros of $f(x)$.)
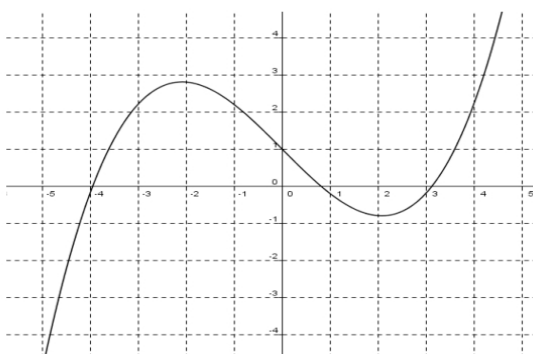
For all following functions, sketch a quick graph of the function (you can use your calculator to
help you), including asymptotes (using dotted lines). Determine the equations of any asymptotes.
Determine the Domain and the Range.

3. $y = \dfrac{1}{1-x}$

4. $y = \dfrac{2}{x^2 - 4}$

5. $y = \dfrac{-1}{x^2 + 0.2}$

6. $y = \dfrac{2x}{2x+1}$

7. $y = \dfrac{x+1}{x^2}$

8. $y = \dfrac{x^2 + 1}{x^2 - 1}$

9. $y = \dfrac{x^2 - 1}{x^2 + 1}$

10. $y = \dfrac{2x^3}{x^3 - 8}$

11. $y = \dfrac{x^2 + 2x - 2}{x - 1}$

12. $y = \dfrac{x^2 + 5x + 6}{x + 2}$