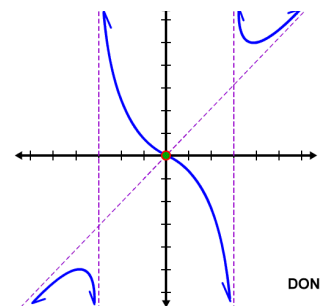**Unit 5.2-5.4 Rational Functions**

By the end of this unit, you should be able to:
- ☐ find the asymptotes of a rational function
- ☐ analyze the graph of a rational function
- ☐ graph rational functions
- ☐ write a possible function for a rational graph
- ☐ solve applied problems involving rational functions
- ☐ solve rational inequalities

Assignments:

5.2 – pg. 352 #23-28, 29, 31, 33, 36, 37, 41-51odd
5.3 – pg. 366 #[9, 13, 15, 18, 25, 33] (use the steps from class), 45, 47, 55, 56
5.4 – pg. 373 #21, 23, 25, 29, 31, 33

Review Problems

For #1-4, find
a) Discontinuities/Holes (if any):
b) Domain:
c) Vertical Asymptote(s):
d) End Behavior Asymptote:
e) x-intercept(s) and multiplicity:
f) y-intercepts(s):
g) Graph the function.
h) Limits of the ends and near each vertical asymptote:
i) Range (if possible):

*1. $f(x) = \dfrac{3}{x-1} + 4$ (*also list transformations)

2. $f(x) = \dfrac{x^2 + 2x - 8}{x^2 - 1}$

3. $f(x) = \dfrac{x^3 + x^2 - 6x}{x^2 + 2x}$

4. $f(x) = \dfrac{x - 4}{x^2 - 7x + 12}$

5. Find all asymptotes: $f(x) = \dfrac{3x^4 + 4}{x^3 + 3x}$

6. Solve $\dfrac{x+2}{x-4} \geq 4$

7. A rational function graph has the following qualities:
   - the graph crosses at the x-intercepts (-1,0) and (4,0)
   - there are asymptotes at $x = -3$, $x = 5$, and $y = 2$
   Write a *possible* function to represent the graph.

8. A can in the shape of a right circular cylinder is required to have a volume of 250 cubic centimeters.
   a) Express the amount A of material to make the can as a function of the radius r of the cylinder.
   b) How much material is required if the can is of radius 3 centimeters?