# Section 2.6 - 2.7 Rational Functions, their graphs and Asymptotes

## Rational Functions

with no common factors

1. Find the vertical asymptote(s), if any, of the graph of the function.
2. Find the horizontal asymptote(s), if any, of the graph of the function.
3. Find the slant asymptote(s) if any, if any, of the graph of the function.

a) $f(x) = \dfrac{2x+1}{x^2-4}$

b) $f(x) = \dfrac{x^2}{2x^2+5}$

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

if there are common factors

d) $f(x) = \dfrac{x^2-3x+2}{x^2-1}$

**Applications:**

4. The game commission had relocated a herd of North American Vegetarian Barking Spiders to state game lands. The size of the herd is expected to follow the model, $B(t) = \dfrac{12.5t+10}{0.1t+2}$ where *B* is the number of spiders and *t* is time in years after the relocation.

a) Find the size of the herd at time of relocation.

b) As time passes, is there a limiting size of the herd?
Is there a limit to the number of spiders as time passes, infinitely? as $t \to \infty, B \to ?$

5. The cost in thousands of $ to safely dispose *p*% of a particular toxic chemical can be modeled by the equation, $C(p) = \dfrac{250p}{100-p}$ .

a) Find the cost to dispose of 0%, 75%, 90% and 95% of the chemical.
b) If possible find the cost to dispose of 100% of the chemical, explain your result.