**Problem Set 3 Part 2**

1. A car gets its best mileage at highway speeds. Sketch a plausible qualitative graph of the gas mileage as a function of speed. Determine a reasonable domain and range for the function and justify your reasoning.
2. Oil is spilled from a tanker into the Pacific Ocean. Suppose the area of the oil spill is approximately a circle and that its radius is increasing at a rate of 2.5 miles per hour. Write the area function in terms of the time since the spill occurred.

6. A bird is collecting seed from a field that contains 100 grams of seed. The time in hours it takes to collect grams of seed is given by

 with 

1. Find the inverse function of *f*
2. Find the domain and range of the inverse function.
3. Calculate  and give a practical interpretation.

7. Based on data from the Kelley Blue Book, the value for a ford Focus ZX5 hatchback years after today can be modeled by the linear model:

(Always in your description include value and the units)

1. What is the practical interpretation of the number -1504 in the formula?
2. What is the practical interpretation of the number 14,632 in the formula?
3. What is the horizontal intercept? And what is the practical interpretation of this value?
4. Use the graph of the function  shown below to answer the following questions.



* 1. Determine the intercepts and asymptotes for the function .
  2. Sketch a graph of .
  3. Determine the intercepts and asymptotes for the function .
  4. Sketch a graph of .
  5. Determine the intercepts and asymptotes for the function .

**PART 3**: Getting ready for the exam1.

9. . Let and . State the domain of each of the following:

(A) Domain of : \_\_\_\_\_\_\_\_\_\_ (B) Domain of : \_\_\_\_\_\_\_\_\_\_\_\_\_\_

(C) Domain of :\_\_\_\_\_\_ D) Domain of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(E) Domain of :\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (F) Domain of \_\_\_\_\_\_\_\_\_\_\_\_\_

(G) Domain of :\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (H) Domain of :\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Solve the following inequalities.

a) b) Assume is a positive constant.

c)  d) 