

# GASOLINE CONSUMPTION

IBMYP: Algebra II Trigonometry

PBL: Investigation Criterion B

Name: \_\_\_\_\_

Group Members: \_\_\_\_\_

\_\_\_\_\_

During this unit you will be asked to work individually and within a small group. At the end of this investigation, ONE group member's work will be collected at random and graded to represent the responses of your group.

I. Your car's gas mileage is 15 mpg. If gas is \_\_\_\_\_ per gallon, and you drive an average of 15,000 miles per year, how much money do you spend on gasoline per year? \_\_\_\_\_ How much money would you save by driving a car that gets 20 mpg? \_\_\_\_\_

II. An automobile company wants to know how much money it can save automobile drivers per year by building cars with better gas mileage. **Write a formula (in simplest form) that will determine how much money will be saved when a driver switches from a car getting  $x$  mpg to a car getting 5 mpg better mileage.** Base your formula on statistics that tell you that the average person drives 15,000 miles per year and spends \_\_\_\_\_ per gallon for gasoline. (Fill in part III before trying to write your formula!)

III. Describe what the independent and dependent variables represent.

IV. Sketch the graph of your function and analyze its graph. Use your calc. to help. Locate its zeros, any asymptotes, and a few points of interest. ☺

Label the "scale" on your graph!

Zeros: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

Points: \_\_\_\_\_

$X_{\min} =$  \_\_\_\_\_

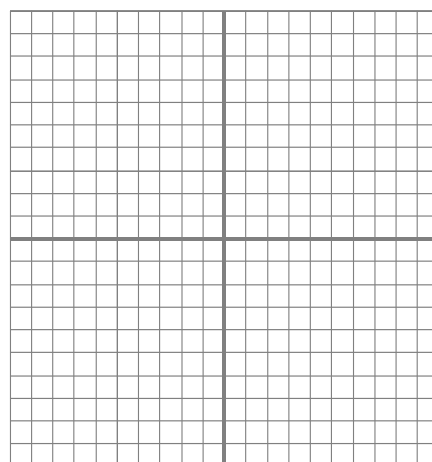
$X_{\max} =$  \_\_\_\_\_

$X_{\text{scale}} =$  \_\_\_\_\_

$Y_{\min} =$  \_\_\_\_\_

$Y_{\max} =$  \_\_\_\_\_

$Y_{\text{scale}} =$  \_\_\_\_\_



1. What part of the graph is relevant to this problem? Why?

2. Explain why each asymptote is relevant?

3. What part of the function's equation is connected to ...*(if there is no connection, or something is undefined, explain WHY?)*

Vertical asymptote(s):

Horizontal asymptote:

Other asymptote(s): ☺

The zero(s):

V. Determine how much money a person would save per year by switching from \_\_\_\_\_ mpg to \_\_\_\_\_ mpg: Also state a type of vehicle that each of the situations below might represent? (You might have each group member find one of the following examples.)

- a vehicle getting 7 mpg to a vehicle getting 12 mpg
- a vehicle getting 18 mpg to a vehicle getting 23 mpg
- a vehicle getting 22 mpg to a vehicle getting 27 mpg
- a vehicle getting 42 mpg to a vehicle getting 47 mpg
- a vehicle getting 60 mpg to a vehicle getting 65 mpg

Savings \$\$\$\$	Vehicle Type

VI. Answer the following questions according to your findings and your general knowledge. ☺ Be prepared to share you findings next class. ☺ Have a discussion at home with someone about these.

1. What factors affect gas mileage?
2. What are the social issues related to vehicle use?
3. What can cause gasoline prices to fluctuate?
4. How do events in other countries affect gas prices?
5. Investigate and describe possible ways to conserve gasoline. How do these solutions affect your family and others?

6. Extension: Graph local average costs over a period of time. Does this graph represent a rational function? If not, can you describe the type of function?