

Appendix E

Fueling Up

Motorists often complain about rising gas prices. Some motorists purchase fuel efficient vehicles and participate in trip reduction plans, such as carpooling and using alternative transportation. Other drivers try to drive only when necessary.

Application Practice

Answer the following questions. Use Equation Editor to write mathematical expressions and equations. First, save this file to your hard drive by selecting **Save As** from the **File** menu. Click the white space below each question to maintain proper formatting.

- Suppose you are at the gas station filling your tank with gas. The function $C(g)$ represents the cost C of filling up the gas tank with g gallons. Given the equation: $C(g) = 3.03(g)$
 - What does the number 3.03 represent?
 - Find $C(2)$
 - Find $C(9)$
 - For the average motorist, name one value for g that would be inappropriate for this function's purpose. Explain why you chose the number you did.
 - If you were to graph $C(g)$, what would be an appropriate domain? Range? Explain your reasoning.
- Examine the rise in gasoline prices from 1997 to 2006. The price of regular unleaded gasoline in January 1997 was \$1.26 and in January 2006 the price of regular unleaded gasoline was \$2.31 (Bureau of Labor Statistics, 2006). Use the coordinates (1997, 1.26) and (2006, 2.31) to find the slope (or rate of change) between the two points. Describe how you arrived at your answer.
- The linear equation

$$y = 0.15x + 0.79$$

represents an estimate of the average cost of gas for year x starting in 1997. The year 1997 would be represented by $x = 1$, for example, as it is the first year in the study. Similarly, 2005 would be year 9, or $x = 9$.

- What year would be represented by $x = 4$?
- What x -value represents the year 2018?
- What is the slope (or rate of change) of this equation?
- What is the y -intercept?

- e) What does the y -intercept represent?
- f) Assuming this growth trend continues, what will the price of gasoline be in the year 2018? How did you arrive at your answer?

4. The line

$$y = 0.15x + 0.79$$

represents an estimate of the average cost of gasoline for each year. The line

$$0.11x - y = -0.85$$

estimates the price of gasoline in January of each year (Bureau of Labor Statistics, 2006).

- a) Do you expect the lines to be intersecting, parallel, or perpendicular? Explain your reasoning.
- b) Use the equations of the lines to determine if they are parallel. What did you find?
- c) Did your answer to part b confirm your expectation in part a?

References

Bureau of Labor Statistics (2006). Consumer price index. Retrieved June 1, 2007 from <http://data.bls.gov/cgi-bin/surveymost?ap>.