

Name _____

Homework Linear Application

1-5 Show work.

1) To take a taxi in downtown St. Louis, it will cost you \$3.00 to go a mile. After 6 miles, it will cost you \$5.25. The cost varies linearly with the distance traveled.

- a) What's the independent variable?
- b) What's the dependent variable?
- c) Write an equation for this linear function.
- d) How many miles can you travel if you only have \$20 to spend?
- e) What is the y-intercept and what does it mean in this problem?

2) As you drive home from the football game, your friend records how long you have been driving, and how many miles you are from home. Your friend finds that you are 45 miles from home after you have been driving for 10 minutes and 40 miles from home when you have been driving for 20 minutes. Assume that the distance varies linearly with time.

- a) What's the independent variable?
- b) What's the dependent variable?
- c) Write an equation for this linear function.
- d) How far was the football game from your house?
- e) What is the rate of change, and what does it mean in this problem?

3) The size of a shoe a person needs varies linearly with the length of his or her foot. The smallest adult shoe size is 5, and fits a 9-inch long foot. An 11-inch foot takes a size 11 shoe.

- a) What's the independent variable?
- b) What's the dependent variable?
- c) Write an equation for this linear function.
- d) Shaq O'Neal wears a size 23 shoe. How long is his foot?
- e) What is a reasonable range for this problem?

4) Bridges on highways often have expansion joints, which are small gaps in the roadway between one bridge section and the next. The gaps are put there so the bridge will have room to expand when the weather gets hot. Suppose a bridge has a gap of 13 mm when the temperature is 22°C , and that it narrows to 9 mm when the temperature warms to 30°C . Assume the gap width varies linearly with the temperature.

- a) What's the independent variable?
- b) What's the dependent variable?
- c) Write an equation for this linear function.
- d) At what temperature would the gap close completely?
- e) What is the rate of change and what does it represent in this problem?

5) The Dunder Mifflin Paper Company finds that there is a linear relationship between the amount of money it spends on advertising and the number of reams of paper it sells. When the company spent \$250, it sold 425 reams, and when it spent \$400, it sold 650 reams of paper.

- a) What's the independent variable?
- b) What's the dependent variable?
- c) Write an equation for this linear function.
- d) What is the y-intercept, and what does it represent in this problem?
- e) If the company spends \$1000 in advertising, how many reams of paper should they expect to sell?
- f) What is the rate of change and what does it mean for this problem?