DVD Club

Linear Equations in Business

Name: _____ Date: _____

Scenario: A group of eighth-graders at your school is thinking of forming a DVD-renting club. Members of the club (those students that pay the membership fee) will be able to rent DVDs at a set price per DVD. The club would also rent DVDs to non-members at a higher price per DVD.

The students decide to charge $9 for a year-long membership to their club. They decide members will be able to rent DVDs at $2 per DVD. Non-members will be able to rent DVDs at $5 per DVD.

1. Write the slope-intercept form for an equation.

2. Let **y** = cost for a member to rent DVDs and **x** = the number of DVDs they rent in one year.
   a. What would **b** (from the slope-intercept equation) represent for members?
   b. What would **m** represent for non-members?

3. Write an algebraic equation, in slope-intercept form, to represent the total cost **y** for a member to rent **x** DVDs in one year.

4. Now let **y** = the cost for a non-member to rent DVDs and **x** = the number of DVDs they rent in one year.
   a. What would **b** represent for non-members? (Remember what b represents for members.)

   b. What would **m** represent for non-members?

5. Write an algebraic equation, in slope-intercept form, to represent the total cost **y** for a non-member to rent **x** DVDs in one year.

6. Graph both equations in an excel spreadsheet. Create a t-chart and graph for each equation.

7. Using your graph, answer the following questions:
   a. What does it mean when both equations have the same **x**? At x = 1, what are the y values for each of the equations?

   b. What does it mean when both equations have the same **y**?

   c. What does it mean when both equations have the same **x** and the same **y**?

   d. What is this point called?

   e. When does this occur?

8. Suppose you are a student interested in renting DVDs from the club. If you only plan to rent 2 DVDs per year, is it more cost-effective for you to be a member or non-member? Why? (Use the equations/graph to explain your answer)

9. How many DVDs could you rent per year where it does not matter, cost-wise, if you are a member or non-member? How can you use your graph to help determine this?

10. Suppose you are a student interested in renting DVDs from the club. If you only plan to rent 7 DVDs per year, do you think it would be more cost-effective for you to be a member or non-member? Why? (Use the equations/graph to explain your answer)

11. If the club decides to change their prices next year to where membership costs $12, members can still rent for $2 per DVD and non-members can rent for $7 per DVD, what would be the new equations for members and non-members?