The Dirty Dawg Salon

Alg1Week18_DogWash.tns

Name _____

Class _____

Part 1 – Setting up the problem

1. Page 1.2 asks you to figure out the per-dog cost. Describe how you found the amount.

2. When you total your expenses, you will have a cost equation. What is the equation you found on page 1.3?

3. Explain below why you think your Mom's price to wash the dog is reasonable, too little, or too much. Remember, your goal is to make a profit.

Part 2 – Finding the break-even point

4. What is the intersection point of the two lines?

5. Interpret the point of intersection in terms of your business of washing dogs by explaining the meaning of the ordered pair (both *x*- and *y*-values).

6. Solve the problem algebraically by setting the equations equal to each other. (substitution)

7. Will you make a profit before you have to buy more shampoo? (Remember that you can wash 32 dogs with one bottle of shampoo.)

Part 3 – Really thinking about the business now

8. Double click the equation **f2(x)** which represents the amount you charge, and change it to a higher price of $4. How does the ordered pair change as you increased the price?

9. What is the new system of equations? Solve the system using the $4 charge.

10. In the spreadsheet on page 1.9, you can calculate any number of dog washes and see how much it will cost you and how much money you will collect from customers. The table is set up for you to use the equations found in **f1(x)** for cost and **f2(x)** for money taken in. Calculate your profit by finding the difference in the two values. Show your work here:

    13 dog washes   14 dog washes

    15 dog washes   20 dog washes

Part 4 – Calculating the profit

11. Use the spreadsheet on page 1.10 to confirm you answers from Question 10. Then calculate some additional values for numbers of dog washes, and how much profit (or loss) you would have as a result.

12. On page 1.11, graph Profit vs. Dogs. Describe the scatter plot.

13. What does it mean to have dots plotted for (dogs, profit) that lie below the horizontal axis ($y = 0$)?

    What does the one point that appears to be on the horizontal axis represent?

    Explain what you know about points that lie above the horizontal axis.

Extension Questions

- Explain what the result would be if you began to charge $3 for small dogs, $4 for medium, and $5 for larger dogs. How would this plan affect your profits?

- What if you hired your younger sibling (or a neighbor or a friend) to help you with the bigger dogs and the laundry? How would you determine how much to pay him or her?

- Describe how the price of the shampoo affects your equation and your profits. What if the shampoo price increases? What if it goes on sale?

- Write an algebraic equation for the profit function used in the spreadsheet when you entered "**income – cost**" and the column filled itself with values for you.