**Applications of Slope-Intercept Form**

During one of the great snowstorms of 2011, snow fell for nine hours at a rate of one-half inch per hour. Before the storm began, there were already six inches of snow on the ground.

1. What is the independent variable?
2. What is the dependent variable?
3. Write a heading for each column and then omplete the table below.

|  |  |
| --- | --- |
|  |  |
| 0 |  |
| 2 |  |
| 4 |  |
| 6 |  |
| 8 |  |

1. Does this situation create and increasing or decreasing function? Explain why.
2. Will the slope of this function be positive or negative? Explain why.
3. a. Make a graph: Plot the points from your table on the following coordinate plane. Make sure to scale and label your axes. Connect the points with a straight line using a ruler.



1. Calculate the slope of the function graphically, or by using the slope formula.

c. What is the real-world meaning of your value of the slope?

d. Find the *y*-intercept of the function. What is the real-world meaning of your *y*-intercept?

e. Write the equation for the line in slope-intercept ($y=mx+b$) form.

1. At some schools in Connecticut school is automatically canceled if there is a foot or more of snow on the ground. Was school canceled the day of this storm (remember, it snowed for a total of nine hours)? Show your work to explain your reasoning.
2. Let’s say the weatherman’s prediction was wrong, and it stopped snowing after 5 hours. How much snow would be on the ground? Show your work to explain your reasoning.
3. Again, let’s say the weatherman’s prediction was wrong, and the storm was worse than predicted. Snow actually fell at the rate of two inches per hour. How would this change your graph? Write a new equation to model this situation.

10. Answer the following questions using the table below based on the Teddy Bear Sale problem from Activity 4.2.7.

|  |  |
| --- | --- |
| **# of bears sold** | **Profit ($)** |
| 0 | -1500 |
| 50 | -900 |
| 100 | -300 |
| 150 | 300 |
| 200 | 900 |
| 250 | 1500 |
| 300 | 2100 |

1. Find the slope of this function. (Make sure to label your answer)
2. Find the *y*-intercept. What does this point represent?
3. Write the equation in $y=mx+b$ form.
4. How many bears must you sell to break even (i.e. make a profit of 0)? Explain how you got your answer.

11. For each of the following situations, identify the slope (use units of measure) and *y*-intercept, state whether the function is increasing, decreasing, or neither, and write the equation that models the function in $y=mx+b$ form.

* 1. You open a new bank account with $50. Each month you deposit $10 into the account. You want to find an equation for the amount of money in your account as a function of time.

*m=\_\_\_\_\_\_\_ b=\_\_\_\_\_\_\_\_\_*Increasing/Decreasing/Neither

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. You are scuba diving off the coast of Florida. Starting at the surface, each minute you descend seven feet into the ocean. What is your distance from the surface as a function of time?

*m=\_\_\_\_\_\_\_ b=\_\_\_\_\_\_\_\_\_*Increasing/Decreasing/Neither

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. You start 4 meters away from the motion detector and do not move. What is your distance from the motion detector?

*m=\_\_\_\_\_\_\_ b=\_\_\_\_\_\_\_\_\_*Increasing/Decreasing/Neither

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. At the start of your trip to Washington D.C., you completely fill your 15 gallon gas tank. Your vehicle averages 26 miles per gallon. The amount of gas in your tank is a function of the miles you drive.

*m=\_\_\_\_\_\_\_ b=\_\_\_\_\_\_\_\_\_*Increasing/Decreasing/Neither

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. At 4 a.m. the temperature outside is -5 degrees Celsius. Every hour the temperature rises by 4 degrees. What is the temperature as a function of time?

*m=\_\_\_\_\_\_\_ b=\_\_\_\_\_\_\_\_\_*Increasing/Decreasing/Neither

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. You are participating in the relay for life walkathon to raise money for cancer research. Your parents agree to pledge $25 regardless of the number of miles you walk. What is the amount of money raised?

*m=\_\_\_\_\_\_\_ b=\_\_\_\_\_\_\_\_\_*Increasing/Decreasing/Neither

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Your club sells popcorn at the hockey games as a fundraiser. It costs you $8 for supplies. You sell each bag of popcorn for $0.75. What is your profit as a function of bags sold?

*m=\_\_\_\_\_\_\_ b=\_\_\_\_\_\_\_\_\_*Increasing/Decreasing/Neither

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Ken wants to buy the new $270 game system, but he had only $15. Each week he saved the same amount of money. The table below shows how much money he will have each week. How many weeks will it take for Ken to have enough money to purchase his game system?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Week** | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| **Amount saved** | 15 | 22 | 29 | 36 | 42 | 49 | 56 |

1. Write an equation in slope intercept form that describes amount saved as a function of the number of weeks.
2. What is the real life meaning of slope in this situation?
3. What is the real life meaning of the *y*-intercept?
4. Solve an inequality or an equation to find how many weeks it will take Ken to save enough money for the game system.
5. An algebra teacher used the motion detector to show his pre-calculus students what the algebra 1 students are learning. He told a student to start 15 feet from the motion detector and walk at a steady pace of 2 feet per second toward the motion detector. The Pre-Calculus students could not figure out an equation for the distance-time graph that the motion detector showed.
	1. Please tell them the equation in slope-intercept form.
	2. Explain to them what the slope means in this situation.
	3. What does the *y*-intercept mean in this situation?