Applications of Linear Equations

Example 1: Bennett and his friends decide to go bowling. The cost for the group is $15 for shoe rentals plus $4.00 per game.

1. What is the y-intercept for this scenario?
2. What is the slope for this scenario?
3. Write an equation relating the total cost, C, of the outing to the number of games bowled, g.
4. How much will it cost them to bowl two games?
5. How many games can they bowl if they have $35.00?
6. Graph the equation.



Example 2: The volume in a fish tank can be represented as , where V is the volume in cubic inches and t is time in minutes.

1. What is the y-intercept for this scenario? What does it mean in context of the problem?
2. What is the slope for this scenario? What does it mean in the context of the problem?
3. How much water is in the tank after 5 minutes?

Example 3. A school can seat 50 students in every bus.

1. Write an equation that represents the number of students, S, able to go on the field trip based on the number of buses, b.
2. If the school is planning on taking 360 students on a field trip to the Polynesian Cultural Center, how many buses will they need?

**Example 4:** The state department of transportation recently filled the road salt storage building on the highway near your house with 2400 tons of road salt. A truck can hold 12 tons of road salt in one load. You can represent this relationship with the equation y = 2400 – 12x, where y is the amount of road salt left in the storage building and x is the number of truck loads of salt.

1. Complete the table below.

|  |  |  |
| --- | --- | --- |
| x | work | y |
| 0 |  |  |
| 15 |  |  |
| 30 |  |  |
| 45 |  |  |

Practice

1. An airplane is at an altitude of 1,200 feet. It begins to ascend at a rate of 925 feet per minute.
2. Write an equation to represent the height of the plane, h, after m minutes.
3. How many minutes will it take the plane to reach 16,000 feet?
4. The amount of money in Shawn’s bank account can be represented by the equation where m is the amount of money in dollars and w is the number of weeks.
5. What is the slope in this equation? What does it mean in the context of the problem?
6. What is the y-intercept in this equation? What does it mean in the context of the problem?
7. After how many weeks will he have only $100 left in the bank?
8. Melissa wants the city to provide every classroom with recycling bins and is in the process of collecting student signatures for her petition. So far Melissa has collected 82 signatures and wants to collect 15 signatures for each classroom she visits during advisory time. If S is the total number of signatures Melissa has collected, and C is the number of classroom visited, write an equation.
9. John swims 34 miles every week. Write an equation to represent the total number of miles, m, John, swam after w, weeks.
10. Fred takes $20 to the arcade and it costs $2 for every game he plays. Fred needs to leave the arcade with $5.00 to pay for lunch, what is the most number of games he can play?
11. Patty has already driven 160 miles on her trip to her grandparents’ house. For every hour she travels she drives an additional 55 miles. Write an equation that represents the relationship between the total miles driven, m, and the number of hours, h.
12. Mr. Williams is purchasing a table and chairs for $1650, including tax and interest. He will pay for the furniture with bi-monthly payments of $95. Write an equation describing a, the amount of the remaining balance after, p, number of payments.
13. The cost to rent a construction crane for a day is $750 plus $250 per hour of use. What is the maximum number of hours the crane can be used during day if the rental cost is not to exceed $2500?
14. During the summer you can find 5 tomatoes on every tomato plant in the garden. Write an equation if T represents the total number of tomatoes and P is the number of tomato plants in the garden.

Homework

This homework is good practice for your quiz! We will go over these problems at the beginning of class before you take your quiz.

1. Write the equation of a line that has a slope of ½ and passes through the point (4, 6).
2. What is the slope of a line that passes through the points (-9, -12) and (5, 7)?
3. What is the equation of a line that passes through the points (-2, -4) and (3, 6)?
4. Graph the equations below.

