Lesson 26A: Writing the Equation of a Line

Classwork

**Example 1**

Fill in the “doubling and adding 5” below:

|  |  |  |
| --- | --- | --- |
| x | Double x and add 5 | y |
|  |  |  |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
| 3 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
| 4 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
| 5 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |

**What is the relationship between x and y?**

Fill in the “Multiply by -3 and add 2” below:

|  |  |  |
| --- | --- | --- |
| x | Multiply x by -3 and add 2 | y |
|  |  |  |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
| 5 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
| 7 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
| 9 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |

**What is the relationship between x and y?**

**Example 2**

The measure of the slope or steepness of a line is found by using the following ratio:

|  |  |  |  |
| --- | --- | --- | --- |
| **Slope** | Difference of the y-coordinates  Difference of the x-coordinates | y2 – y1  x2 – x1 | Given two points on a line  (x1, y1) and (x2, y2), where x2 ≠ x1. |

Find the slope of the line Find the slope of the line

that passes through the points that passes through the points

(7, 19) and (1, 7). (-5, 4) and (-2, 2).

Find the slope of the line Find the slope of the line

that passes through the points that passes through the points

(-1, 3) and (4, 3). (3, -1) and (3, -5).

**How do you create the equation of a line?**

**Step 1:**  Find the slope:

**Step 2:** Choose an ordered pair:

**Step 3:** Find the y-intercept:

**Plug into the equation**

y = mx + b

(solve for b):

**Example 3**

Write in slope-intercept form the equation of a line that passes through the given points.

1. (7, -5) and (-5, 1) 2. (0, 8) and (-3, 5)

**Find the slope:**

**Choose an ordered pair:**

**Plug into the equation**

**y = mx + b**

**(Solve for b):**

**Write the equation of a line given the slope and a point in slope-intercept form y = mx +b.**

3. Write the equation of the line 4. Write the equation of the line

that passes through the point that passes through the point

(3, 5) and has a slope of 4. (-6, 3) and has a slope of 3.

3

**The slope is:**

**The ordered pair is:**

**Plug into the equation**

**y = mx + b**

**(solve for b):**

Problem Set 26A

**Write an equation of the line in slope-intercept form. y = mx + b**

1. The slope is 2 and y-intercept is 3.

2. The slope is –2; the y-intercept is 5.

3. The slope is ½; the y-intercept is -4.

4. The slope is 0; the y-intercept is 2.

**Write an equation in slope intercept form of the line that passes through the points.**

5. (1, -7), (3. -15) 6. (5, 0), (-10, -5) 7. (2, 3), (6, 11) 8. (-5, 9), (-2, 0)

Lesson 26B: Writing the Equation of a Graphed Line and Word Problems

Classwork

**Example 1**

**Write the equation of the line in slope-intercept form.**

a. b.

**Example 2**

**Determine which equation best represents each situation.**

a. y = b. y = 2x + 225 c. y = 8x + 4

1. Tickets to a concert cost $8 each plus a processing fee of $4 per order.

2. The freshman class has $225. They sell raffle tickets at $2 each to raise money for a field trip.

3. The current water level of a swimming pool is 6 feet. The rate of evaporation is inch per day.

**Example 3**

A local recreation center offers yearly membership for $265. The center offers aerobic classes for an additional $5 per class.

a. Write an equation that represents the total cost of membership.

b. Carly spent $500 one year. How many aerobic classes did she take?

**More on Linear Relationships**

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**The cost of renting a car for a day is $64.00 plus $0.25 per mile. Let x represent the number of miles the car was driven and let y represent the rental cost, in dollars, for a day.**

a. Write an equation for the rental cost of the car in terms of the number of miles driven.

b. Find the missing member of each of the following ordered pairs, which are elements of the solution set of the equation written in part **a**, and explain the meaning of each pair.

**(1) (155, ?) (2) (?, 69)**

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**The table below shows the number of domestic flights in the U.S. from 2004 to 2008. Write an equation that could be used to predict the number of flights if it continues to decrease at the same rate.**

|  |  |
| --- | --- |
| **Year** | **Flights**  **(millions)** |
| **2004** | **9.97** |
| **2005** | **10.04** |
| **2006** | **9.71** |
| **2007** | **9.84** |
| **2008** | **9.37** |

Problem Set 26B

**Write an equation in slope-intercept form of the line shown in the graph.**

**Write a linear equation that represents each of the following**.

7. **Home Repairs** Mr. Casola has $300 for home repairs. A plumber charges him $50 an hour. Write the equation that represents the amount of money left in his budget after x number of plumbing hours.

8. **Earth Science** Suppose you take a hot-air balloon ride on a day when the temperature is 24◦C at sea level. The temperature goes down 6.6 degrees for each kilometer traveled to the ground. Write the equation that represents the temperature at x kilometers above sea level.

9**. Write the equation of a line that passes through the points (9, -2) and (4, 3).**

10. **The table below shows the total cost for premium cable for 5 months. The total cost per month represents a monthly fee and a one-time setup fee. Write an equation that could be used to find the total price y for any number of months.**

|  |  |
| --- | --- |
| **Month** | **Total cost** |
| **1** | **$64.95** |
| **2** | **$104.90** |
| **3** | **$144.85** |
| **4** | **$184.80** |
| **5** | **$224.75** |

**What is the monthly fee, (rate per month)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**What is the setup fee? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**