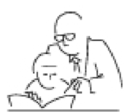
Lesson Objective: Determine the slope when given the equation for a line.

Vocabulary Box

slope — The steepness of a line expressed as a ratio, using any two points on the line.
Example: In $y = \frac{1}{2}x + 6$, $\frac{1}{2}$ is the slope.

***y*-intercept** — The value of y at a point where the line crosses the y-axis.
Example: In $y = \frac{1}{2}x + 6$, 6 is the y-intercept.



Guided Practice

Directions: Complete the following practice problems. Your teacher will review the answers. Make sure that you show all your work.

I. Work with a partner to find the slope of the line that is represented by each equation.

1. $y = \frac{5}{2}x - 3$

2. $y = -1.3x + 0.8$

3. $y = x$

4. $-8y = 4x - 24$

II. Work independently to find the slope of the line that is represented by each equation.

1. 5x + 5y = 20

2. –4x – 7y = –9x + 42

Summary/Closure

A. Vocabulary Words
Directions: Answer the following questions about today's vocabulary words.

1. What is the slope of the line represented by the equation y = –5x + 4?

2. Describe the vertical and horizontal movement of the line with this slope when it is graphed on a coordinate plane.

3. What is the *y*-intercept of this line?

4. Explain how you found the *y*-intercept.

B. Summarize What We Learned Today

Directions: Write three sample equations and find the slope of each. Be sure that at least two of your sample equations are not originally in slope-intercept form. Then write a few sentences explaining how to find the slopes for these equations. You will use this explanation as a personal reminder.

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Independent Practice

Directions: Complete the following practice problems on your own. Your teacher will review the answers. Make sure that you show all of your work.

I. Find the slope of the line that is represented by each equation.

1. $y = -4x + 1$

2. $y = \frac{7}{6}x - 2$

3. $y = x + \frac{3}{2}$

4. $y = 7$ (Hint: Think of the slope-intercept form, $y = mx + b$)

II. Change each equation so that it is in slope-intercept form. Then find the slope of the line that is represented by each equation.

1. $y - 2x = -5$

2. $y + 8x = 5x + 9$

3. $3y = -12x - 33$

4. $-2y = -7x + 14$

5. $3x + 5y = 45$

BONUS?

Find the slope of the line that is represented by each of the following equations.

1. $2y = \frac{1}{3}x + 18$

2. $\frac{1}{4}y = -7x - 3$

3. $4x - 3y + 7 = 3x + 5y - 15$

Problem Solving

Directions: Use problem-solving strategies to solve the following word problem. You may use graph paper and a ruler to complete this activity.

Lenny remembered that he graphed 3 lines using the 12 ordered pairs below, but he got the ordered pairs all mixed up. Help Lenny by reorganizing the 12 ordered pairs into 3 groups of 4 ordered pairs each, so that 3 straight lines can be drawn. Once you have the ordered pairs correctly reorganized, graph each line.

Hint: Each line includes an ordered pair with an *x*-value of 0.

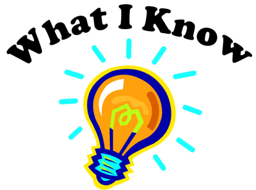
(0, 2) (8, 2) (0, 3) (4, 3)

(0, 4) (1, 4) (2, 4) (–4, 5)

(2, 6) (4, 5) (6, 6) (3, 8)

Write an equation in slope-intercept form for each of the three lines you graphed.

What is the slope of each line?



Directions: Find the slope and *y*-intercept of the line that is represented by each of the following equations.

1. $y = -\frac{3}{5}x + 4$

2. $5y = -35x - 105$

3. $6x - 2y = 22$

Lesson Objective: You will choose and use an appropriate problem-solving strategy.

Guided Practice on Problem Solving Strategies

Directions: As you work with your partner on problem-solving strategies, write the answers to the following questions:

I. Many people are familiar with the fact that, when tossing two number cubes, the most popular outcome is a sum of 7. This can be shown to be true by completing the following addition table.

	1	**2**	**3**	**4**	**5**	**6**
1	2	3	4	5	6	7
2	3	4	5	6		
3	4	5				
4						
5						
6						

1. Complete the table.

2. How many possible outcomes are there?

3. Which outcome occurs most often?

4. How many times does it occur?

5. Work with your partner to find the probability of tossing two number cubes and getting a sum of 7.

6. With a partner, discuss any patterns in the table that you see. Write your ideas below.

7. If you toss two number cubes 300 times, how many sums of 7 would you expect to get?

8. Tossing the cubes 300 times is a bit unrealistic. What is a more realistic number of times to toss the cubes that will allow you to test your answer to the last question?

9. With your partner, toss the cubes 30 times and record the sums. Each of you can toss one of the cubes. You can toss them simultaneously.

10. Discuss with your partner your results for 30 tosses and how this allows you to estimate the outcome of 300 tosses.

II. Let's try an addition table with some negative integers.

	-6	-5	-4	-3	-2	-1
1						
2						
3						
4						
5						
6						

1. Complete the table.

2. Which outcome occurs most often?

3. What is the probability of this outcome?

4. Discuss with a partner whether it was necessary to complete another table to discover this. What problem-solving strategy might have helped you to get these answers more quickly?

III. Now, with your partner, observe three number cubes. Imagine that we are tossing all three number cubes. Two of them are regular number cubes, but one of them has negative integers on each face instead of positive integers. We want to find all the possible sums when tossing these number cubes.

1. How many outcomes are possible?

2. Will a table like the ones above work well? Explain.

3. What would be a better problem-solving strategy to use? Explain.

4. Use your chosen problem-solving strategy to find the possible sums for adding two positive addends and one negative addend. Do not list all 216 sums. Just list the different sums that are possible.

Problem Solving

Directions: Use problem-solving strategies to solve the word problems. You may use a number cube and graph paper.

For this activity, imagine tossing a number cube twice. The first toss represents the *x* value of an ordered pair. The second toss represents the *y* value of the ordered pair. For example, if you toss a 5, and then you toss a 3, this will give you the ordered pair (5, 3).

1. Use a problem-solving strategy to list all of the possible ordered pairs.

2. Explain how you found your answer. Which problem-solving strategy did you use?

3. If you pick one of the ordered pairs you listed random, what is the probability that it will lie on the line that is represented by the equation $y = x + 2$?

4. Explain how you found your answer. Which problem-solving strategies did you use?

5. If you pick one of the ordered pairs above at random, what is the probability that it will lie on the rectangle that connects the ordered pairs (2, 2), (5, 2), (5, 4), and (2, 4)?

6. If you pick one of the ordered pairs above at random, what is the probability that it will lie in the interior of the rectangle that connects the ordered pairs (2, 2), (5, 2), (5, 4), and (2, 4)?

7. Explain how you found your answers. Which problem-solving strategies did you use?