Name _____ Class _____ Date _____

Practice 6-2

Estimating Solutions of Linear Systems by Inspection

1. Without graphing, decide whether the system of equations has one solution, no solution, or infinitely many solutions.

$y = 3x + 14$

$y = -3x + 14$

2. Without graphing the equations, decide whether the system has one solution, no solution, or infinitely many solutions.

$5y = x - 9$ $\qquad$ $4x - 10y = 18$

3. Does this system have one solution, no solution, or an infinite number of solutions?

$$3x + 2y = 7$$
$$27x + 18y = 5$$

4. How many solutions does this system have?

$$x + 5y = 0$$
$$25y = -5x$$

5. Writing How many solutions does the system of equations have?

$$8x + 10y = 21$$
$$y = -\frac{4}{5}x + 24$$

b) Write a situation you could model using this system of equations. Then interpret the number of solutions in the context of your situation.

6. Reasoning How many solutions are there for this system of equations?

$y = 9x + 1$

$y = 7x + 1$

❍ A. Exactly one solution, because the slopes are not equal.

❍ B. No solution, because the slopes are equal and the y-intercepts are not equal.

❍ C. No solution, because the y-intercepts are not equal.

❍ D. Exactly one solution, because the slopes are equal but the y-intercepts are not equal.

❍ E. Infinitely many solutions, because the slopes are equal and the y-intercepts are equal.

7. Error Analysis Charlene says that this system of equations has infinitely many solutions.

$13x + 4y = 33$ $26y + 8x = 66$

a) How many solutions does the system have?

b) What error might Charlene have made?

❍ A. Charlene compared the slope in the first equation to the y-intercept in the second.

❍ B. Charlene found the y-intercept incorrectly.

❍ C. Charlene compared the y-intercept in the first equation to the slope in the second.

❍ D. Charlene found the slope incorrectly.

8. Space Exploration Two rovers are exploring a planet. The system of equations shows each rover's elevation, y, at time x.

Rover A: $y = 1.9x - 6$
Rover B: $3y = 5.7x - 18$

a) Without graphing these equations, what conclusion can you make about the system of equations?

❍ A. The system has infinitely many solutions

❍ B. The system has exactly one solution.

❍ C. The system has no solution.

b) Interpret your results in the context of the problem.

9. Mental Math By inspecting the equations, what can you determine about the solution(s) of this system?

$y = 6x + 16$
$4y = 24x + 68$

❍ A. The system has exactly one solution.

❍ B. The system has infinitely many solutions.

❍ C. The system has no solution.

10. Decide if the system of equations has one solution, no solution, or infinitely many solutions.

$3x + 18y = 252$
$6x - 36y = 128$

❍ A. Exactly one solution

❍ B. No solution

❍ C. Infinitely many solutions

11. Think About the Process Consider the following system of equations.

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

a) What must be true for a system of equations to have infinitely many solutions?

- ❍ A. The slopes must be equal and the y-intercepts must be equal.
- ❍ B. The slopes must be equal and the y-intercepts must not be equal.
- ❍ C. The slopes must not be equal.

b) How many solutions does the system of equations above have?

- ❍ A. No solution
- ❍ B. Exactly one solution
- ❍ C. Infinitely many solutions

12. Think About the Process

a) Under what circumstances does the system of equations $Qx + Ry = S$ and $y = Tx + S$ have infinitely many solutions?

- ❍ A. When $T = -Q$ and $R = 1$
- ❍ B. When $T = Q$ and $R = -1$
- ❍ C. When $T = Q$ and $R = S$
- ❍ D. When $T = -Q$ and $R = S$

b) Use your result to make a conclusion about the system of equations $-5x + y = 8$ and $y = 5x + 8$.

- ❍ A. The system has infinitely many solutions.
- ❍ B. The system has no solution.
- ❍ C. The system has exactly one solution.
- ❍ D. There is not enough information to make a conclusion.

Practice 6-2: Estimating Solutions of Linear Systems by Inspection

1. One solution
2. One solution
3. No solution
4. Infinitely many solutions
5. **a)** No solution
   b) Answers will vary
6. A
7. **a)** One solution
   b) D
8. **a)** A
   b) Answers will vary
9. C
10. A
11. **a)** A
    b) B
12. **a)** A
    b) A