

Module 7 Lesson 5

TT 17. *Foundations and Pre-calculus Mathematics 10* (Pearson), questions 4, 5, 6, 7, 10, 11, and 12 on page 448 **Possible Solutions**

4. a) i) 1
ii) -1
iii) 1
iv) -1

b) Lines i) and iii) are parallel, and lines ii) and iv) are parallel.

c) The following lines intersect:

- i) and ii)
- i) and iv)
- ii) and iii)
- iii) and iv)

5. a) These lines form a linear system with one solution:

- A and C
- B and C

b) Lines A and B form a linear system with no solution.

6. a) The following systems result in no solution:

$$\begin{array}{ll} 4x + 2y = 20 & x - 3y = 12 \\ 6x + 3y = 5 & 5x - 15y = -60 \end{array}$$

b) Answers may vary. Here are two examples of systems that result in exactly one solution:

$$\begin{array}{ll} 6x + 3y = 5 & x - 3y = 12 \\ 2x - 6y = 24 & 2x + y = 10 \end{array}$$

c) The following systems result in an infinite number of solutions:

$$\begin{array}{ll} 4x + 2y = 20 & x - 3y = 12 \\ 2x + y = 10 & 2x - 6y = 24 \end{array}$$

7. a) There are different coefficients in front of the y variables, so there is one solution.

b) The lines are multiples of each other, so there are infinitely many solutions.

c) The coefficients are the same for x and y and constants are different, so they are parallel lines. There is no solution.

- d) The coefficients are the same for x and y and constants are different, so they are parallel lines. There is no solution.
10. If the signs of the two slopes are different, the slopes are different and the lines will intersect once.
11. The value of the y -intercept is needed. If the y -intercept is the same, the system will have infinitely many solutions. If the y -intercepts are different, the system will have no solution.
12. The student is required to write an equation in three different linear systems.

One Solution

Multiply the x -term by one constant and the y -term by a different constant.

$$3x - 4y = 12$$

$$6x + 2y = 12$$

No Solutions

Multiply the terms on the left side of one equation by a single constant. Then multiply the term on the right side by a different constant.

$$3x - 4y = 12$$

$$3x - 4y = 24$$

Infinitely Many Solutions

Multiply the terms of one equation by a single constant to obtain the second equation.

$$3x - 4y = 12$$

$$18x - 24y = 72$$