Lesson Notes 6-2

Number of Solutions

1. The Number Of Solutions To A Linear System Of Equations

   A. Graph the following system of equations and sketch the result in the grid provided.

     ✱ $2x - 3y = 3$ and $5x + y = 16$

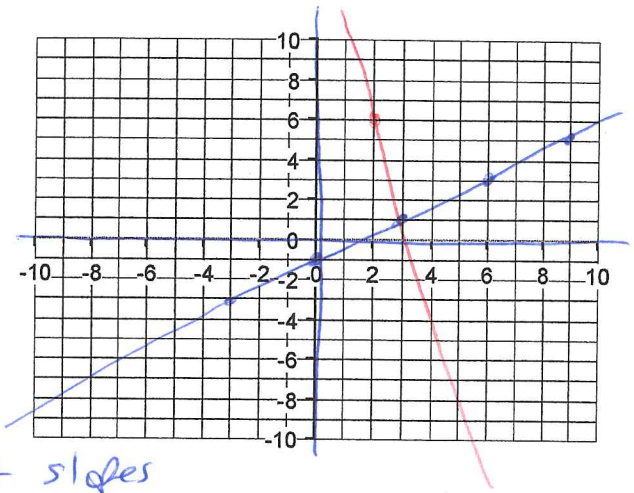 $-3y = -2x + 3$ $y = -5x + 16$

      • What do you notice about the graphs?

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

      • At how many points does the graph of the first equation intersect the graph of the second equation.

      $1 \Rightarrow$ different slopes

      • How are the equations alike? How are they different?

  B. Graph the following system of equations and sketch the result in the grid provided.

     ✱ $2x - 5y = 15$ and $2x - 5y = -5$

      $-5y = -2x + 15$ $-5y = -2x - 5$

      • What do you notice about the graphs? What are their slopes? What are their y-intercepts?
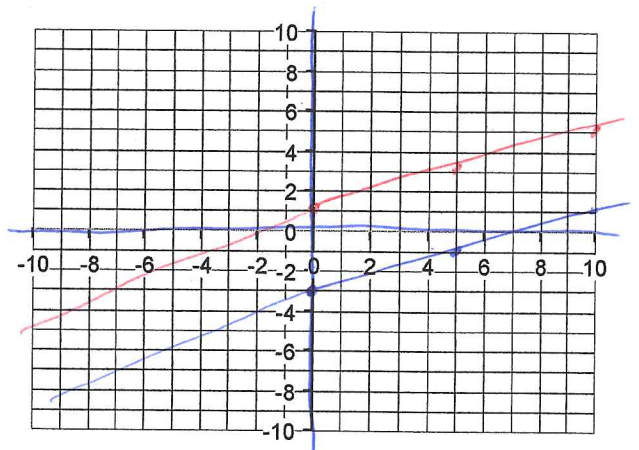
      $y = \frac{2}{5}x - 3$ $y = \frac{2}{5}x + 1$

      • The solution to a system of equations are the points where the graphs intersect. How many solutions are there?

      0

      • How are the equations alike? How are they different?

      • Predict when a system of equations will have no solution.

      slopes are equal; y-intercepts are different

- Check your prediction with this system of equations. $3x + 2y = 8$ and $3x + 2y = 3$

- Graph to see how many solutions this system has. $4x - 3y = 12$ and $8x - 6y = 30$

- If necessary, modify your prediction to write a statement to describe when a system of linear equations has no solution.
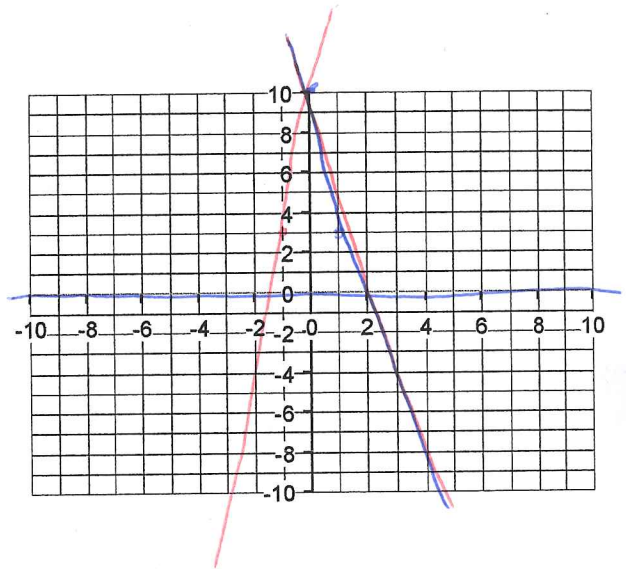
C. Graph the following system of equations and sketch the result in the grid provided.

$-7x + y = 10$ and $-14x + 2y = 20$

$y = +7x + 10 \qquad 2y = 14x + 20$

- What do you notice about the graphs? What are their slopes? What are their y-intercepts?

$y = 7x + 10$

- At how many points does the graph of the first equation intersect the graph of the second equation?

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- The solution of a system of equations are the points of intersection of the graphs. How many solutions does this system have?

- How are the equations alike? How are they different?

Same slope, Same y-intercept.

- Make a prediction about the number of solutions of a system where one equation is a multiple of the other.

- Check your prediction by creating and graphing another similar system of equations. Write the new system of equations here.