Alg1Lesson32PlanKey

Monday, January 11, 2016 3:45 PM

Lesson32Key

Name: key Class Period:

Lesson 32 Guided Notes

Warm-Up

Directions: Complete problems below and be prepared to share your answers. After you finish, write down today's homework from the Daily Bulletin in your Assignment Log.

Jimmy is bicycling to visit a friend. It takes him half an hour to reach his friend's house averaging 20 miles per hour. Jimmy and his friends walk to a park fifteen minutes away. The friends walk 3 miles per hour to and from the park. They sit and talk in the park for an hour before walking back to the friend's house. Since Jimmy is tired, it takes him forty-five minutes to bicycle home at 15 miles per hour.

1.) How long did it take for Jimmy to bicycle to his friend's house? 30 minutes $= \frac{1}{2}$ hour

2.) How long did it take for Jimmy walk to the park? 15 minutes

3.) How long was Jimmy stationary at the park? 60 minutes

4.) How long did it take for Jimmy to walk back from the park? 15 minutes

5.) How long did it take for Jimmy to bicycle home? 45 minutes

Video Notes

1.) What part of the puzzle did the people in the video try to complete first?

The border.

2.) How did the people work on the puzzle? Was there a strategy?

Group by pattern or picture.

3.) Were there any parts of the puzzle that followed a pattern or looked the same?

Group the similar pieces and then attach them on the side.

Puzzle Solving Strategy

Group the similar pieces and work in from the border.

Key Notes

A piecewise function is a function that is defined differently for different disjoint intervals in its domain.

Steps for Writing a Piecewise Function

1. Identify the input and output of the function.
2. Find the parameters of the function (find the domain intervals).
3. Find the patterns/equations for each domain.
4. Write the function by writing the patterns/equations for the correct domain intervals
5. Adjust equations by checking for continuity along the domain.

Jimmy is bicycling to visit a friend. It takes him half an hour to reach his friend's house averaging 20 miles per hour. Jimmy and his friends walk to a park fifteen minutes away. The friends walk 3 miles per hour to and from the park. They sit and talk in the park for an hour before walking back to the friend's house. Since Jimmy is tired, it takes him forty-five minutes to bicycle home at 15 miles per hour.

1.) How fast did Jimmy bicycle to his friend's house? 20 mph
2.) How fast did Jimmy walk to the park? 3 mph
3.) How fast was Jimmy moving in the park? 0 mph
4.) How fast did Jimmy walk back from the park? 3 mph
5.) How fast did Jimmy bicycle home? 15 mph

in miles

Example 1

in hours

$$d(t)=\begin{cases} 20t, & \text{when } 0\le t\le 0.5 \\ 3t+8.5, & \text{when } 0.5< t\le 0.75 \\ 0t+10.75 & \text{when } 0.75< t\le 1.75 \\ 3t+5.5, & \text{when } 1.75< t\le 2 \\ 15t-18.5, & \text{when } 2< t\le 2.75 \end{cases}$$

When $t=0.5$, $d(0.5)=20(0.5)=10$ miles. The second equation must start at 10 miles. So, $3(0.5)=1.5$. $10-1.5=8.5$. $3t+8.5$

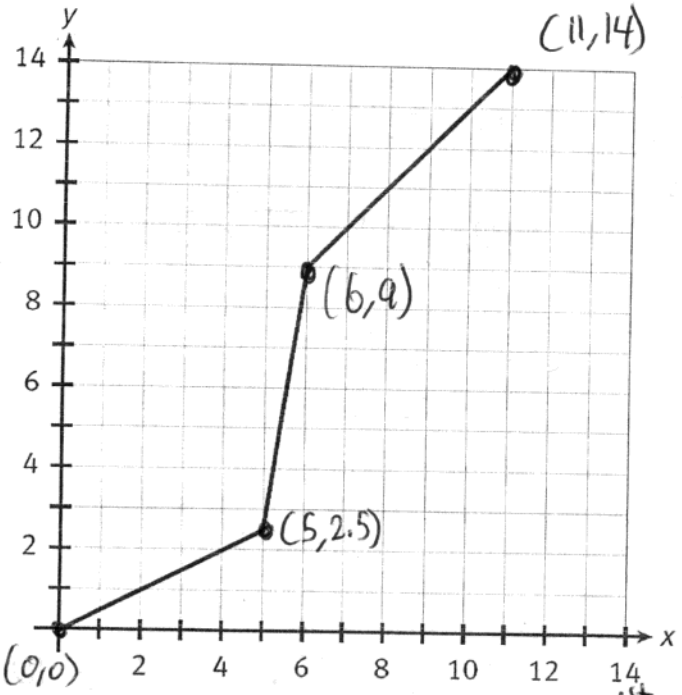
When $t=0.75$, $d(0.75)=3(0.75)+8.5=2.25+8.5=10.75$. The third equation must start at 10.75 miles. So, the equation is 10.75

When $t=1.75$, $d(1.75)=10.75$ as he did not move. The fourth equation must start at 10.75 miles. So, $3(1.75)=5.25$. $10.75-5.25=5.5$.

When $t=2$, $d(2)=3(2)+5.5=6+5.5=11.5$. The fifth equation must start at 11.5 miles. So, $15(2)=30$. $30-11.5=18.5$.

Example 2

Write a piecewise-defined function for the graph, including the domain for each part.



Slopes

1st $\frac{\Delta y}{\Delta x} = \frac{2.5-0}{5-0} = \frac{2.5}{5} = \frac{1}{2}$

2nd $\frac{\Delta y}{\Delta x} = \frac{9-2.5}{6-5} = \frac{6.5}{1} = 6.5$

3rd $\frac{\Delta y}{\Delta x} = \frac{14-9}{11-6} = \frac{5}{5} = 1$

$$f(x) = y = \begin{cases} \frac{1}{2}x, & \text{when } 0 \le x \le 5 \\ 6.5x - 30, & \text{when } 5 < x \le 6 \\ x + 3 & \text{when } 6 < x \le 11 \end{cases}$$

1st $\frac{1}{2}(5) = \frac{5}{2} = 2.5$

2nd $6.5(5) = 32.5$

$2.5 - 32.5 = -30$ (2nd / 3rd)

3rd $6.5(6) - 30 = 39 - 30 = 9$

$(6) = \frac{6}{3}$

Example 3

Evaluate the piecewise function above at $x = 7$.

$f(7) = 7 + 3 = 10$

Evaluate the piecewise function above at $x = 9$.

$f(9) = 9 + 3 = 10$

Homework 32

1.) Speed Cell Wireless offers a plan of $40 for the first 400 minutes, and an additional $0.50 for every minute over 400. Let t represent the total talk time in minutes. Write a piecewise-defined function to represent the cost $C(t)$.

$$C(t) = \begin{cases} 40, & \text{when } 0 \le t \le 400 \\ 0.5t - 160, & \text{when } t > 400 \end{cases}$$

$$0.5(400) = 200$$
$$-40$$
$$160$$

2.) If Pam works more than 40 hours per week, her hourly wage for every hour over 40 is 1.5 times her normal hourly wage of $7. Write a piecewise-defined function that gives Pam's weekly pay $P(h)$ in terms of the number of hours h that she works.

$$7 \cdot 1.5 = 7 \cdot \frac{3}{2} = \frac{21}{2} = 10.5$$

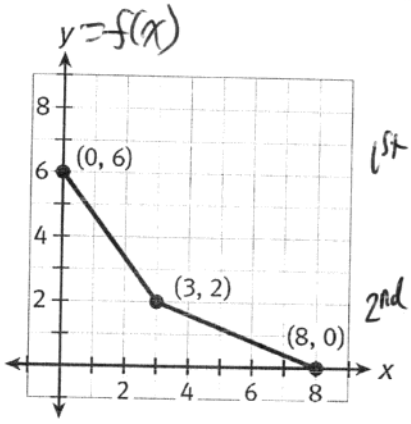
$$P(h) = \begin{cases} 7h, & \text{when } 0 \le h \le 40 \\ 10.5h - 140 & \text{when } h > 40 \end{cases}$$

$$7 \cdot 40 = 280$$

$$10.5 \cdot 40 = 400 + 20 = 420$$

$$420 - 280 = 140$$

3.) Write a piecewise-defined function for the graph shown.



1st $\frac{\Delta y}{\Delta x} = \frac{6-2}{0-3} = \frac{4}{-3} = -\frac{4}{3}$, $b = 6$

2nd $\frac{\Delta y}{\Delta x} = \frac{2-0}{3-8} = \frac{2}{-5} = -\frac{2}{5}$

y-intercept

$$f(x) = y = \begin{cases} -\frac{4}{3}x + 6, & \text{when } 0 \le x \le 3 \\ -\frac{2}{5}x + \frac{16}{5}, & \text{when } 3 < x \le 8 \end{cases}$$

$f(3) = -\frac{2}{5}(3) = -\frac{6}{5}$

Shift needs to be at 2.

$2 - -\frac{6}{5} = 2 + \frac{6}{5}$

$= \frac{10}{5} + \frac{6}{5}$

$= \frac{16}{5}$ (up)

4.) Evaluate the piecewise function above at $x = 2$.

$f(2) = -\frac{4}{3}(2) + 6 = -\frac{8}{3} + 6 = -\frac{8}{3} + \frac{18}{3} = \frac{10}{3}$

5.) Evaluate the piecewise function above at $x = 5$.

$f(5) = -\frac{2}{5}(5) + \frac{16}{5} = -\frac{10}{5} + \frac{16}{5} = \frac{6}{5}$

6.) Ashley participated in a triathlon.

1st
- She swam for 10 minutes at a rate of 40 meters/min.

2nd
- Then she biked for 40 minutes at a rate of 400 meters/min.

3rd
- Finally, she ran for 25 minutes at a rate of 200 meters/min.

Write a piecewise-defined function expressing the distance $d(t)$ in meters that Ashley traveled as a function of time t in minutes.

$$d(t) = \begin{cases} 40t, & \text{when } 0 \le t \le 10 \\ 400t - 3{,}600, & \text{when } 10 < t \le 50 \\ 200t + 6{,}400, & \text{when } 50 < t \le 75 \end{cases}$$

1st $d(10) = 40(10) = 400$ meters

2nd $400(10) = 4{,}000$ meters

$-3{,}600$ meters

2nd $d(50) = 400(50) - 3{,}600 = 20{,}000 - 3{,}600 = 16{,}400$ meters

3rd $200(50) = 10{,}000$ meters

$6{,}400$ meters

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Alg1Lesson33Plan

Algebra I
Unit 3
01/12-13/16

Lesson 33 – Overlap

Learning and Social Objective(s)

1. Students will be able to graph the solutions of a system of linear inequalities.
2. Students will be able to determine whether an ordered pair is a solution of a system of linear inequalities.
3. Students will be able to solve systems of linear equations by using the substitution method, using the elimination method, and by graphing.
4. Students will keep electronic devices away during class.

Agenda [103 minutes]

1. Warm-Up 33 [12 min]
2. Review Lesson 32 [10 min]
3. Apple Word/Objectives [5 min]
4. Lesson 33 Guided Notes [70 min]
5. Wrap-Up [5 min]

Apple word

- Overlap: an area that belong to two or more different regions.

Scaffolding

- Graphing an inequality on a number line
- Graphing an inequality on a graph
- Knowing how the solution to a system of linear equations takes

CFU

- Class Response (Recital), Think-Pair-Share

Homework 33 (Due 01/14-15/16)

- Lesson 33 Guided Notes Homework pages 6-9 #1-8

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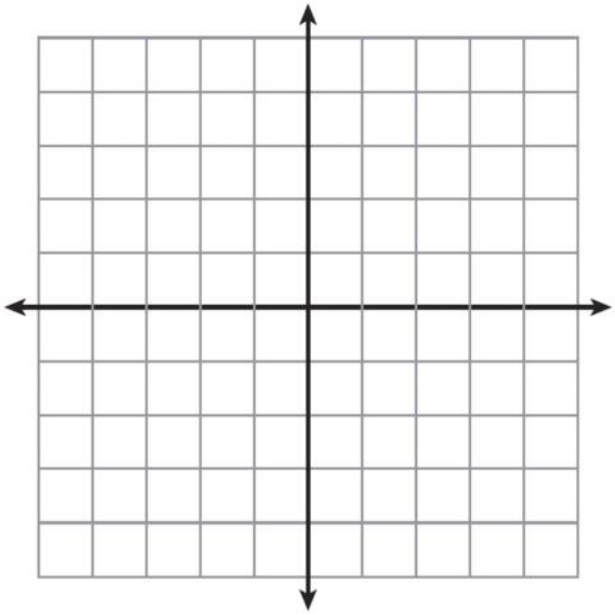
Lesson 33 Guided Notes

Warm-Up

Directions: Complete problems below and be prepared to share your answers. If you finish early, write down today's homework from the Daily Bulletin.

1.) Solve $\begin{cases} y = 2x - 1 \\ y = 3x - 3 \end{cases}$ by graphing.



2.) Name the other ways to solve a system of linear equations.

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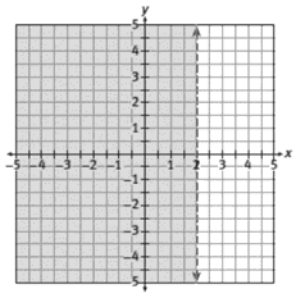
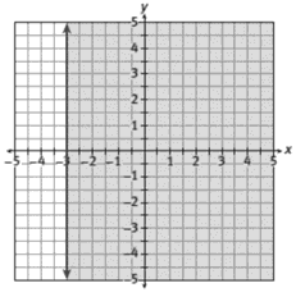
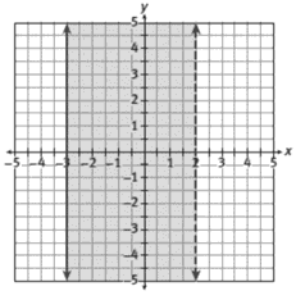
3.) Graph each inequality on the number lines and grids.

Inequality	Graph all x	Graph all (x, y)
$x < 2$		
$x \geq -3$		
$x < 2$ and $x \geq -3$		

4.) What does an open circle represent?

5.) What does a closed circle represent?

6.) What does a dashed line represent?

7.) What does a solid line represent?

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Example 1

Solve using the substitution method. Check your solution.

$$y = x - 2$$
$$2x + 2y = 4$$

Example 2

Solve by the elimination method. Check your solution.

$$4x - 5y = 30$$
$$3x + 4y = 7$$

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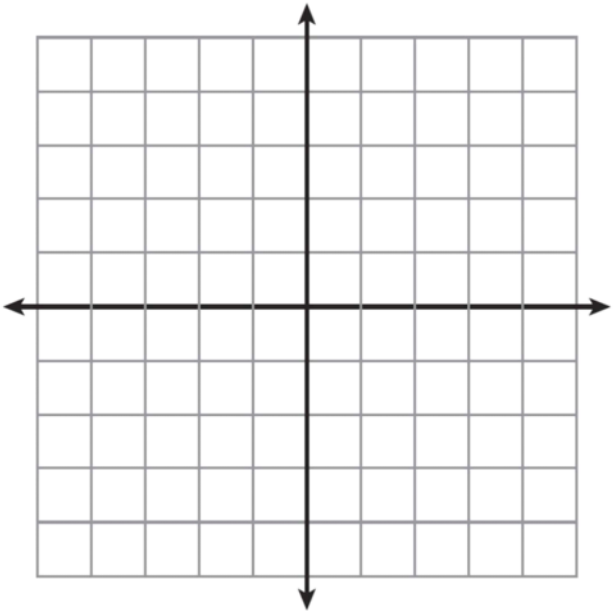
Example 3

Solve by graphing. Check your solution.

$y = 2x - 3$
$y = x - 1$



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Key Notes

Solving a _____ of linear inequalities means finding _____ solutions that are common to all inequalities in the _____.

The region where the inequalities of the system overlap is called the _____ _____.

Steps to Solve a System of Inequalities

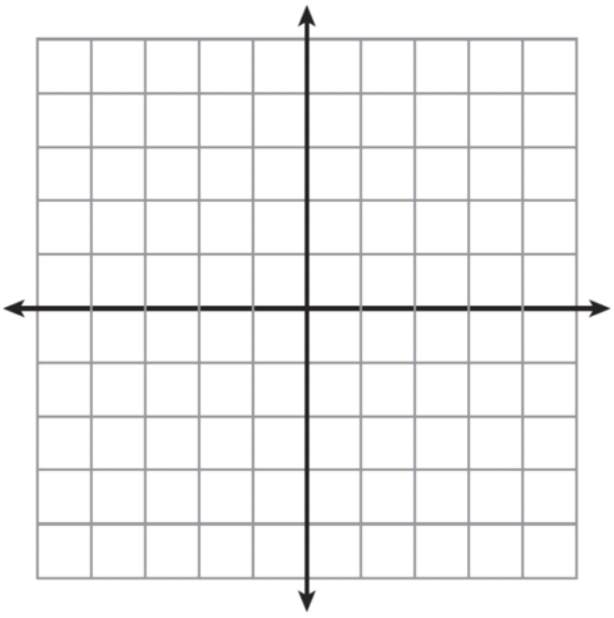
1.) Rearrange the inequalities to make graphing easier.
2.) Graph both inequalities (including shading).
3.) Shade the region where the two inequalities overlap with a different color or style.

Example 4

Solve the following system of inequalities. Check a solution.

$3x + y < 3$

$x - y > 1$



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Homework 33

Problem 1

Solve using the substitution method. Check your solution.

$$y = 4x - 8$$
$$y = 2x + 10$$

Problem 2

Solve using the substitution method. Check your solution.

$$3x - 6y = 30$$
$$y = -6x + 34$$

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Problem 3

Solve by the elimination method. Check your solution.

$$3x - 2y = -21$$
$$2x + 5y = 5$$

Problem 4

Solve by the elimination method. Check your solution.

$$7x + 5y = 9$$
$$4x - 3y = 11$$

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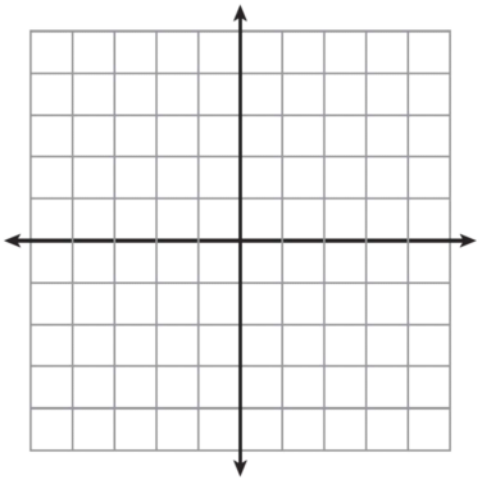
Problem 5

Solve by graphing. Check your solution.

$y = -5x + 4$

$y = \frac{3}{4}x - 3$

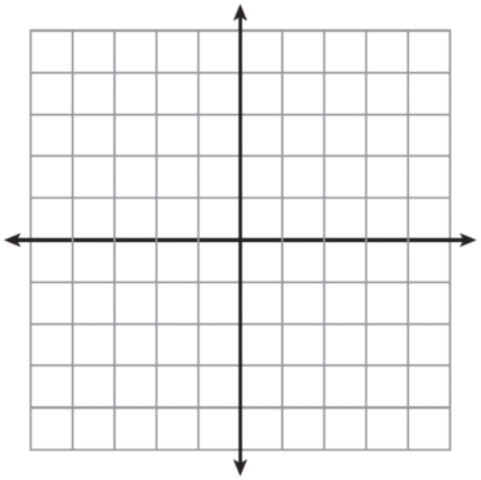


Problem 6

Solve by graphing. Check your solution.

$y = 2x + 6$

$4x - 2y = 8$



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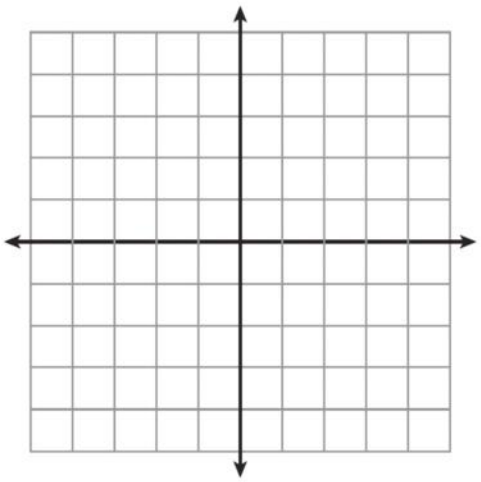
Problem 7

Solve the following system of inequalities. Check a solution.

$$y \geq x - 1$$
$$y \leq -\frac{1}{2}x + 2$$



Problem 8

Solve the following system of inequalities. Check a solution.

$$x + y > 2$$
$$2x - y \geq -5$$