



Chapter 6

Functions

6.1A Constant Rate of Change

I can...

Identify proportional and nonproportional linear relationships by finding a constant rate of change

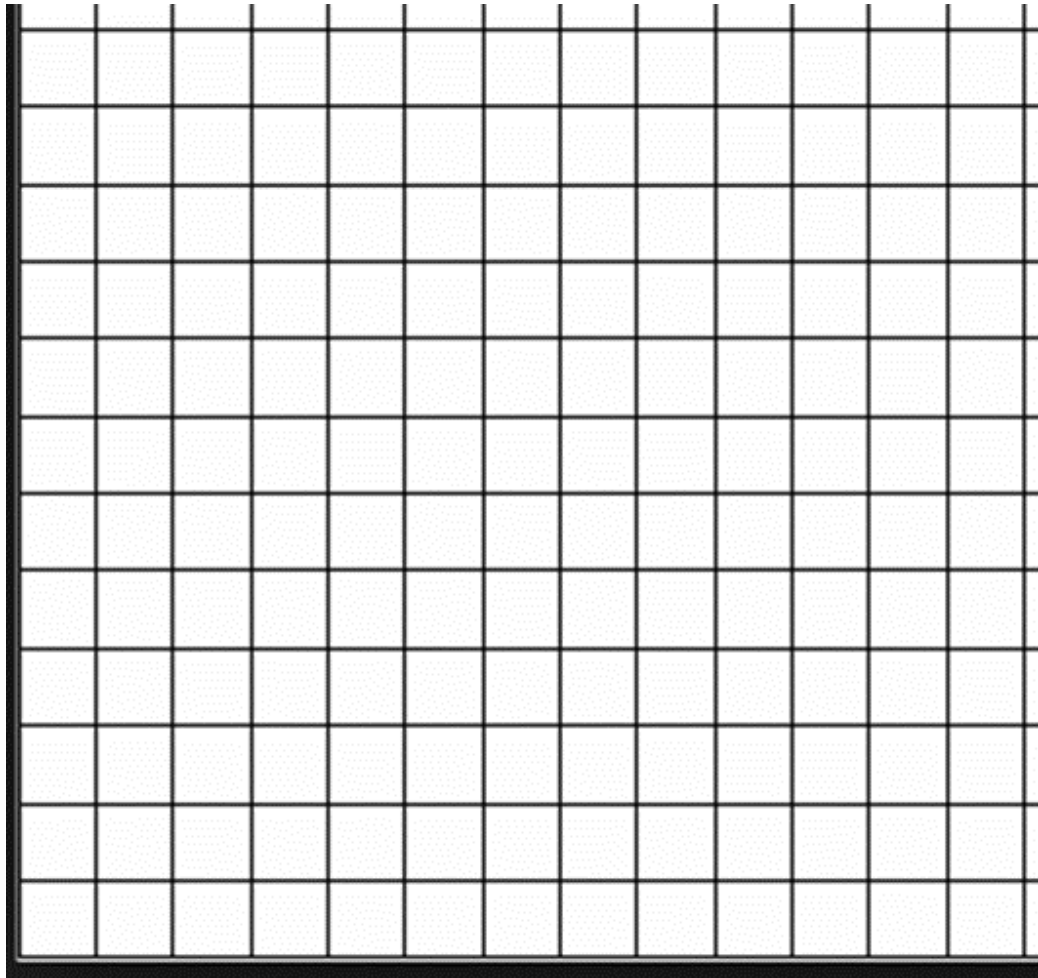
Vocabulary:

- Linear relationships - have straight line graphs
- Constant rate of change - rate of change between any two points in a linear relationship is the same

Constant Rate of Change with Tables

Hours	Charge
1	\$10
2	\$18
3	\$26
4	\$34

Constant Rate of Change with a Graph



Think: Are these relationships proportional?

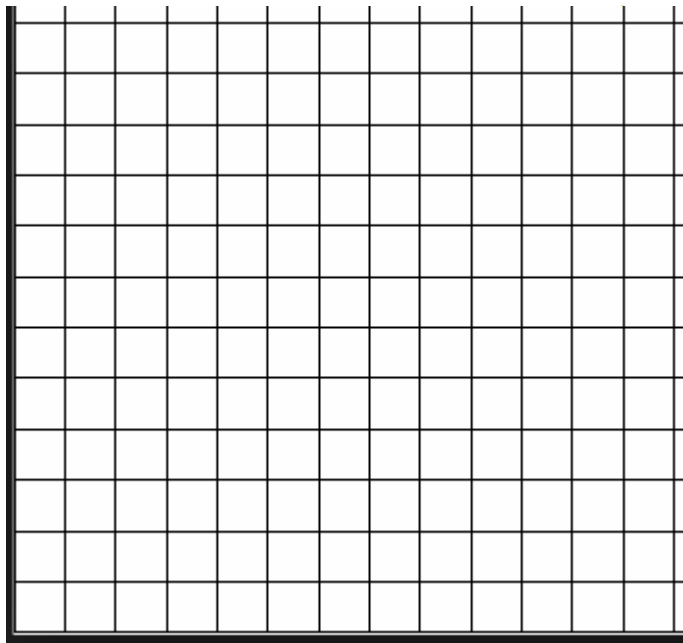
Number of Hotdogs	2	4	6	8
Minutes	1	2	3	4

Number of Hotdogs	3	5	7	9
Minutes	1	2	3	4

Graph the Tables

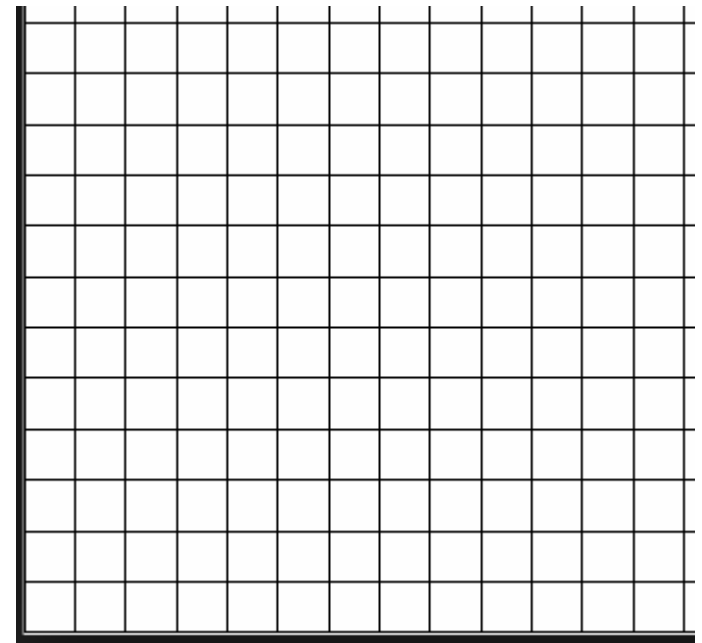
Number of Hotdogs	2	4	6	8
Minutes	1	2	3	4

Number of Hotdogs	3	5	7	9
Minutes	1	2	3	4



Proportional?

Linear?



How do I determine if relationship is proportional linear relationship?

Must have:

- Graph must be a straight line (linear)
- Constant rate of change



Homework:

Workbook p. 97 & 98

6.1C Slope

I can...

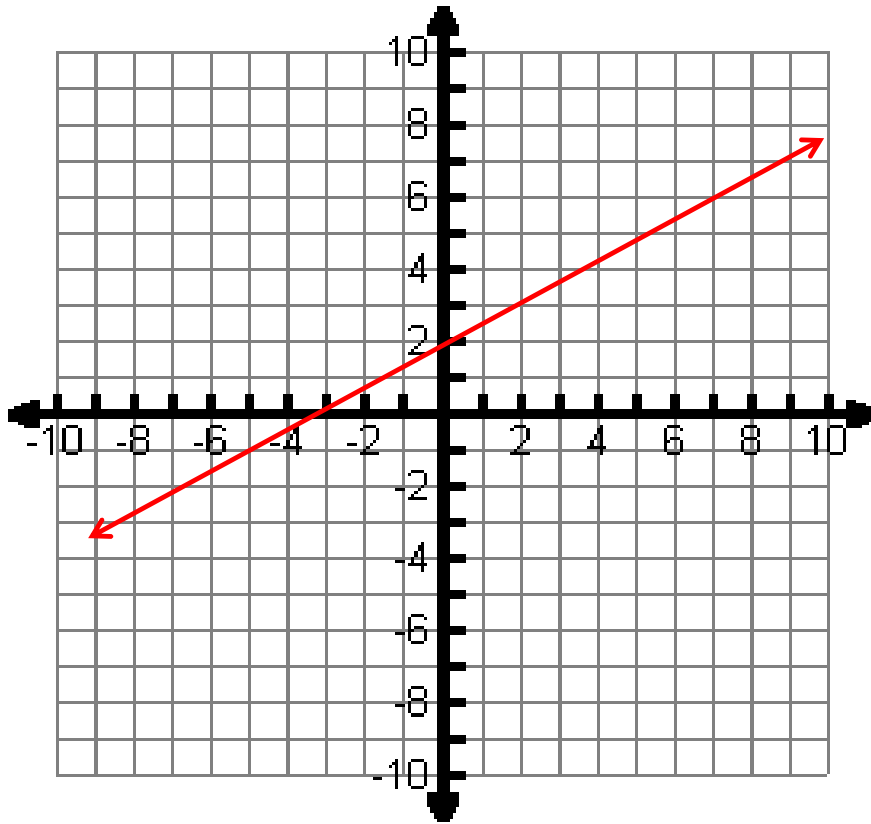
find the slope of a line.

Slope

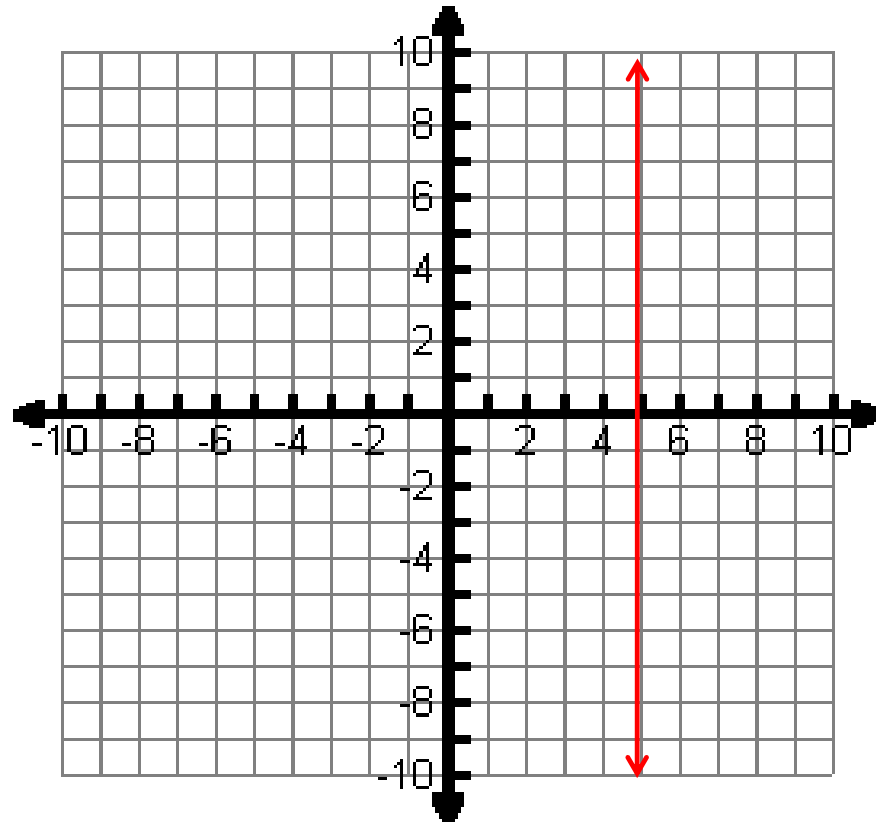
The slope of the nonvertical line passing through the points (x_1, y_1) and (x_2, y_2) is:


$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\textit{rise}}{\textit{run}}$$

Example: Find the slope of the line




Example: Find the slope of the line





Example: Find the slope of the line that goes through the points $(3, 8)$ and $(3, 4)$



Example: Find the slope of the lines that goes through the points at $(-4, 1)$ and $(-3, 2)$.



Homework:

p. 347 #9-22, 25

6.1E Direct Variation

I can...

use direct variation to solve problems.


Direct Variation

Linear relationship where the ratio of y to x is a constant k .

$k = \text{constant of variation}$

Symbols: $k = \frac{y}{x}$ or $y = kx$


Example: $y = 3x$



Example: The variables x and y vary directly, and $y = 19.22$ when $x = 6.2$.

a) Write an equation relating x and y .

b) Find y when $x = 4.3$.



Example: The total cost for cans of soup varies directly as the number of cans purchased. If 4 cans of soup cost \$5, how much would it cost to buy 8 cans?

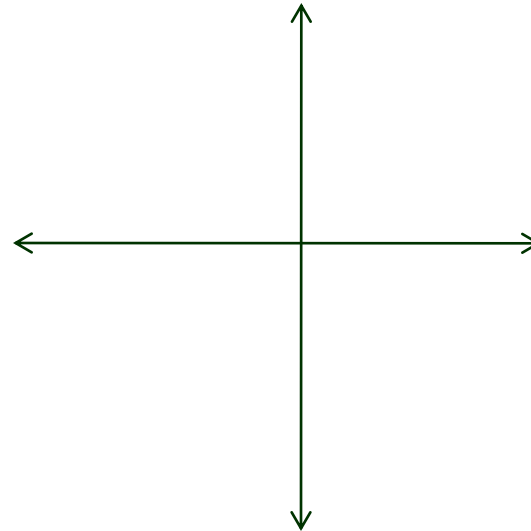
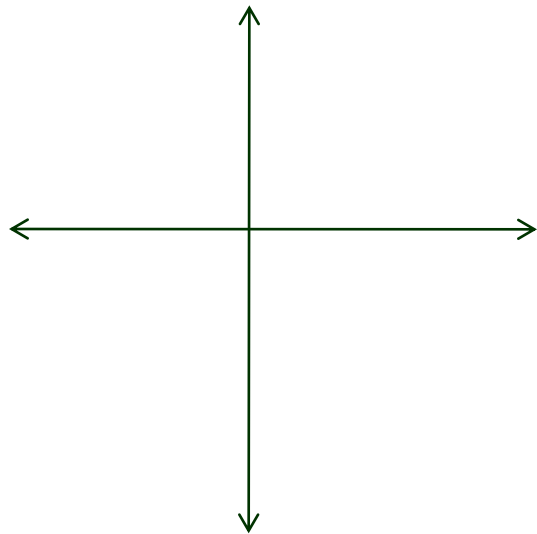
Two methods:

Example: Determine whether each linear function is a direct variation. If so, state the constant of variation.

Days, x	3	6	9	12
Hours worked, y	25	50	75	100

Properties of Graphs of Direct Variation Equations

- The graph of a direct variation equation is a line through the origin
- The slope of the graph of $y = kx$ is k





Graphs of Direct Variation:



Homework:

p. 354 #4-20

6.2A Slope-Intercept Form

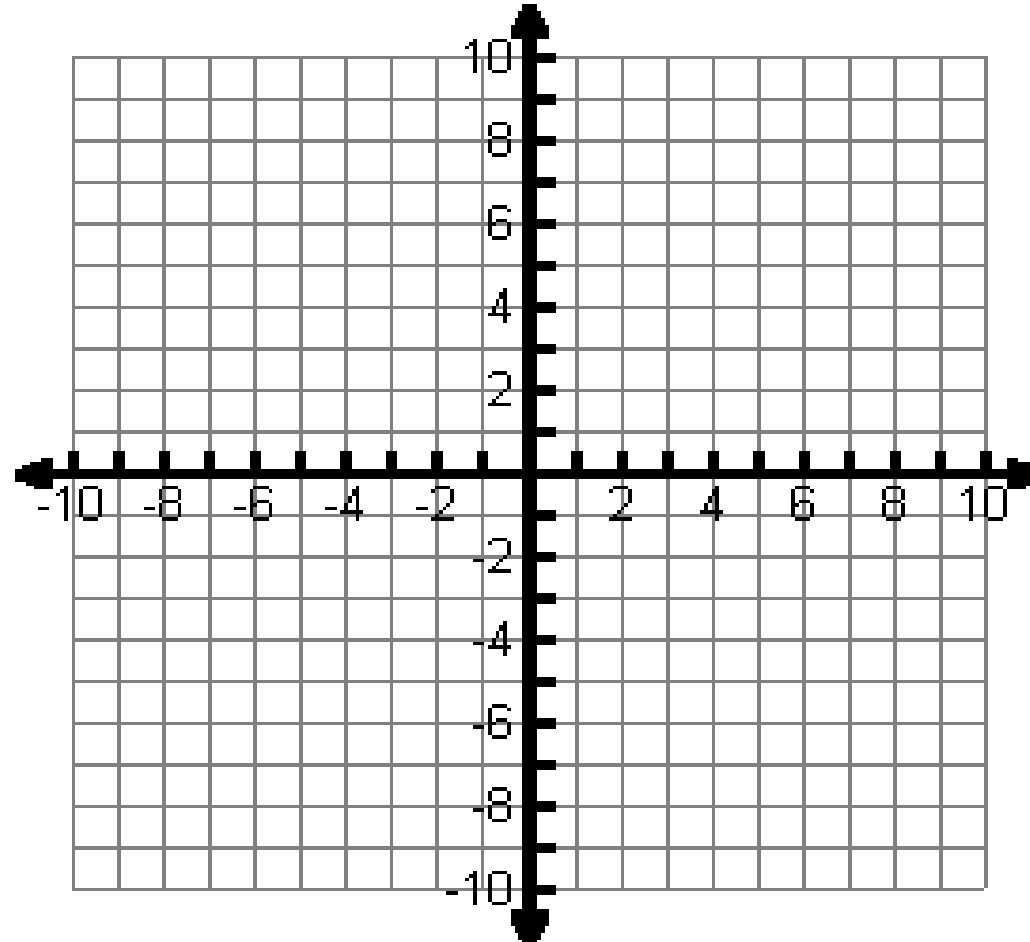
I can...

graph linear equations using the slope and y-intercept

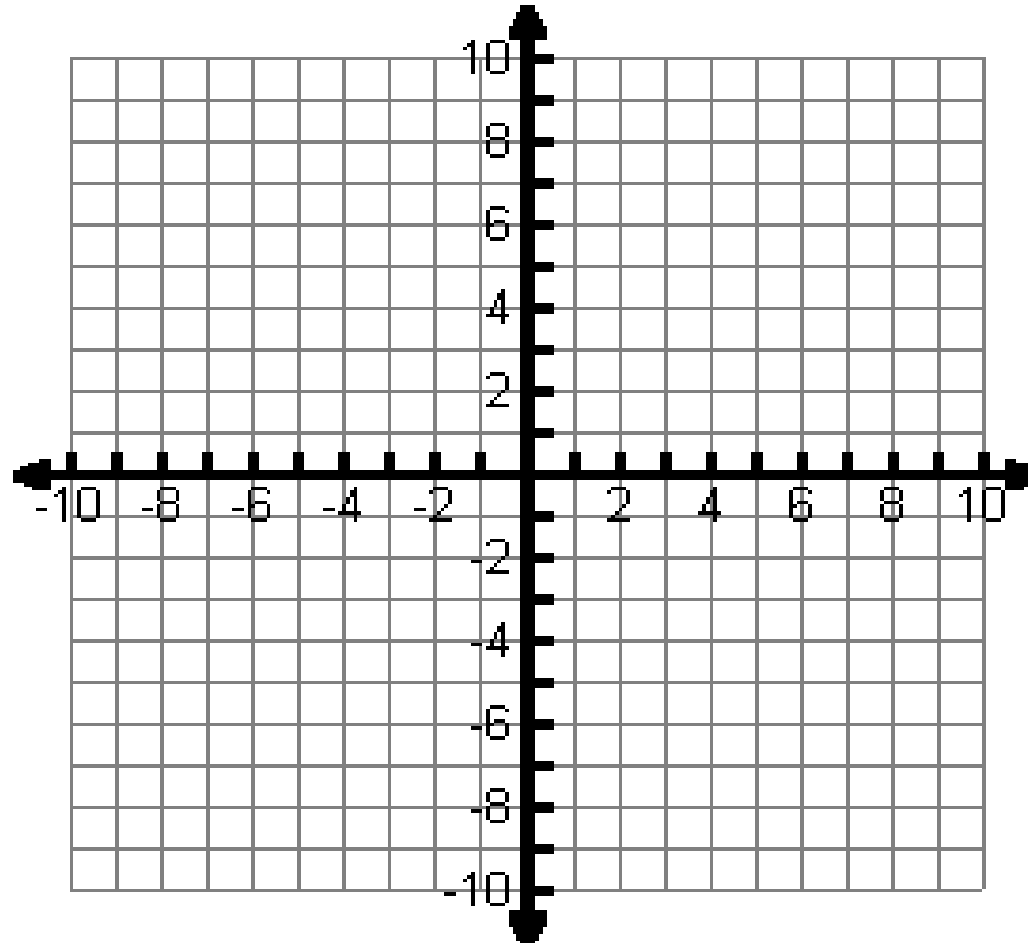
Slope-Intercept Form

$$y = mx + b$$

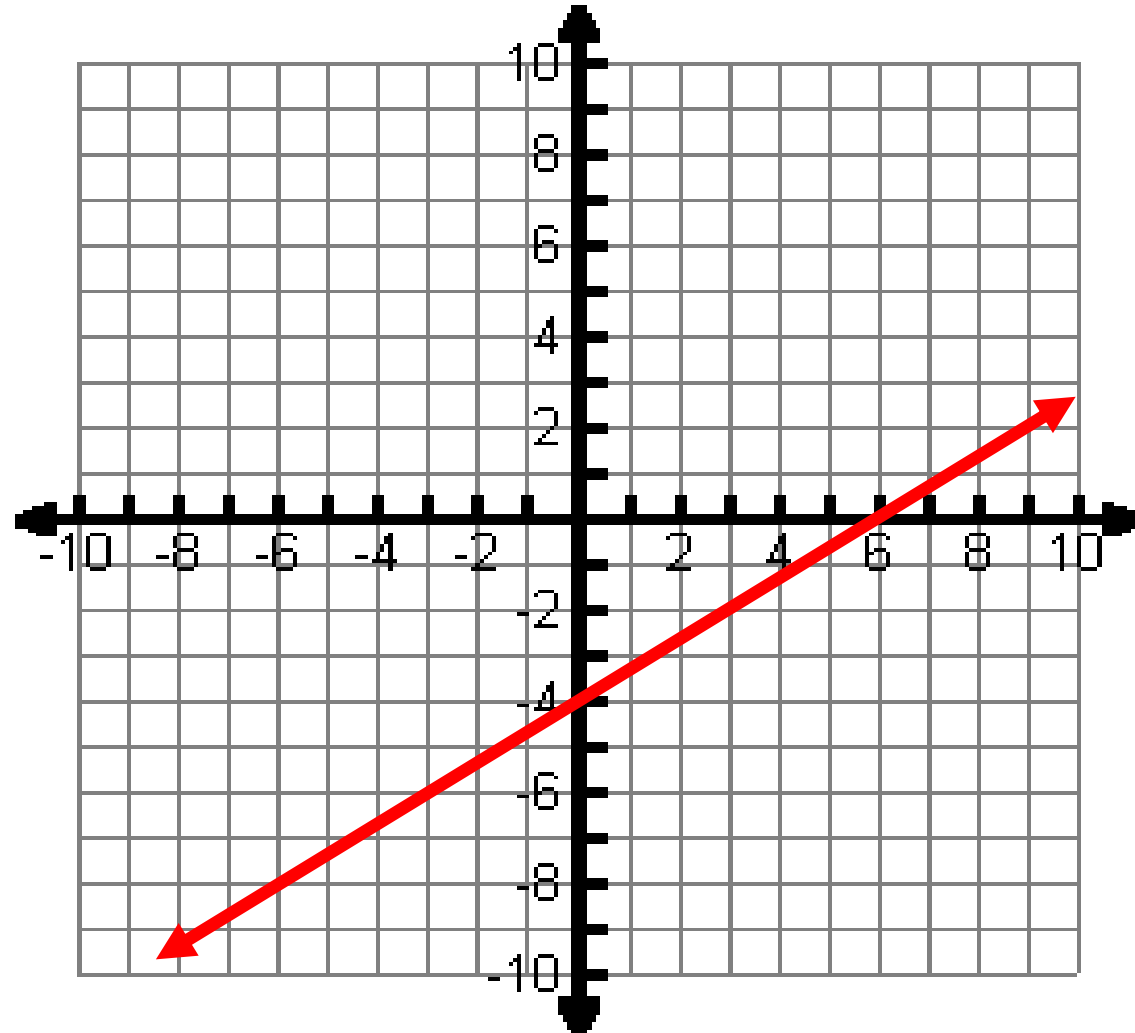
Example: Graph $y = \frac{1}{2}x + 1$



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



Example: Write an equation in slope-intercept form for the graph.



Example: State the slope and y-intercept of the graph of each equation.

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

2) $2x + y = 8$



Homework:

p. 360 #7-27

6.2B Graph Functions Using Intercepts

I can...

Graph a function using the x - and y - intercepts.

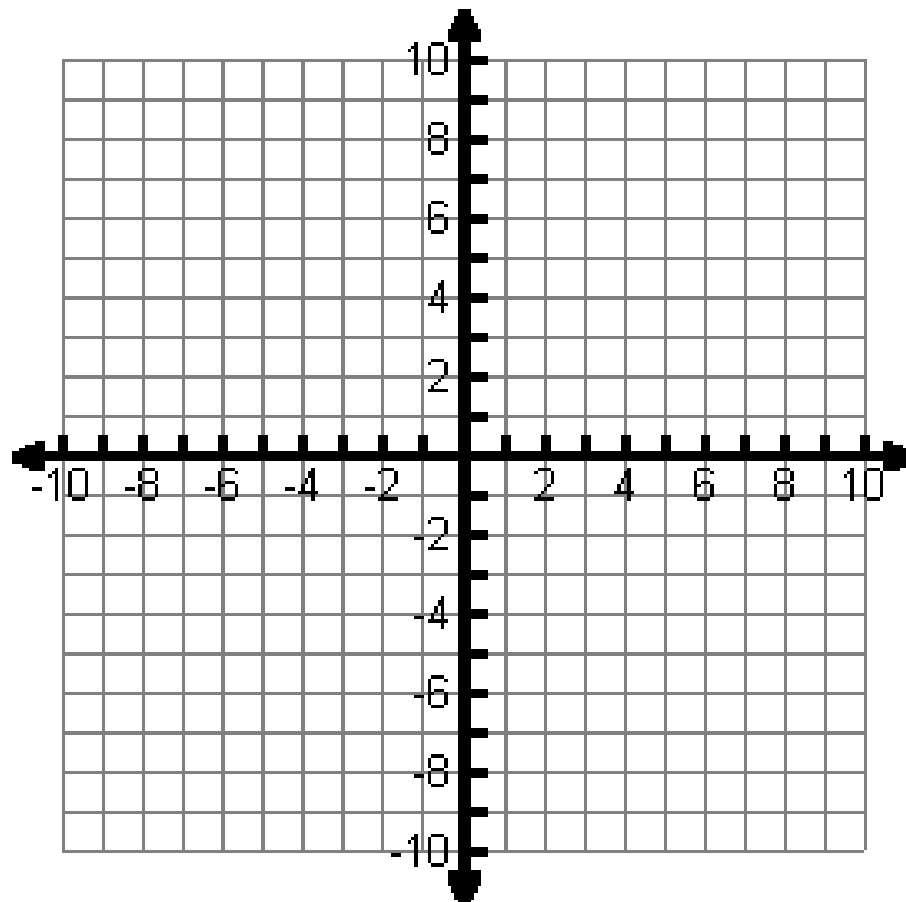
Intercepts


- A quick way to graph an equation in standard form is to plot its intercepts.

Example: Graph a line with equation in standard form

Graph $3x + 4y = 12$.

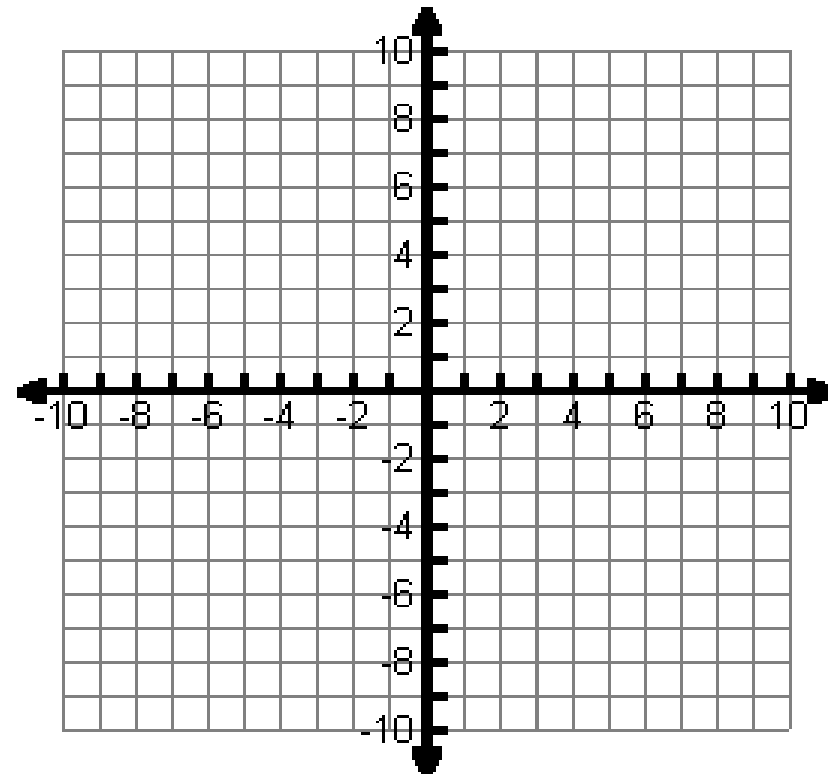
The equation is in standard form, so you can use the intercepts.





Example: Find the x - and y - intercepts for $2x + 5y = 10$

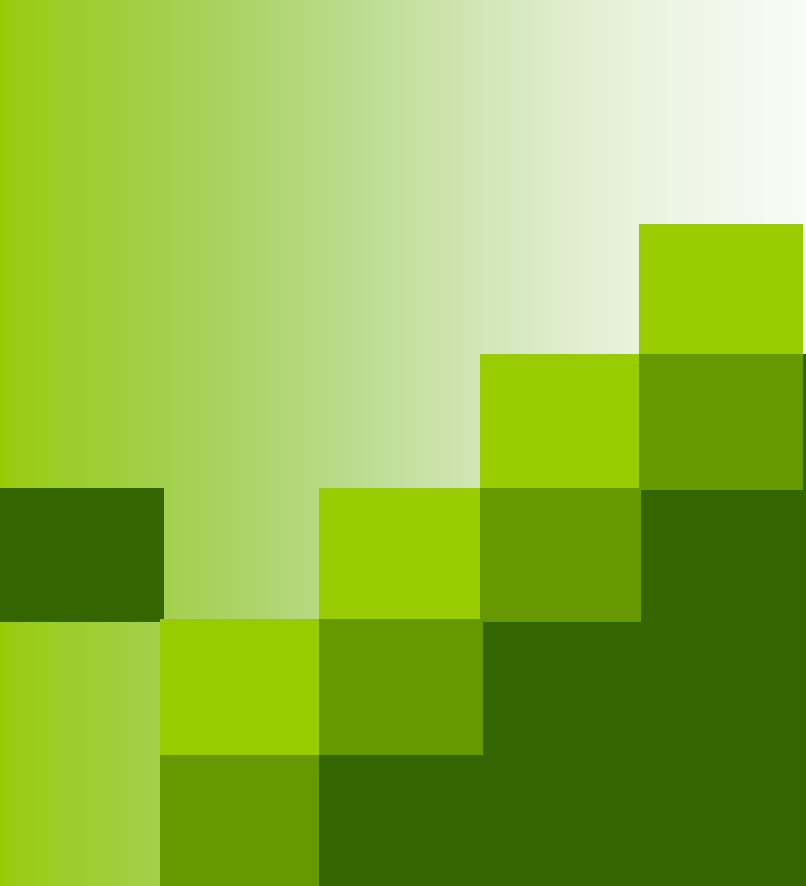
Example: Graph $3x - 2y = 6$ using intercepts method..





Homework:

p. 365 #8-19, 21



Chapter 6


MidChapter Test

6.3C Solve Systems of Equations by Graphing

I can...

Solve systems of equations by graphing

CCSS 8.EE.8, 8.EE.8a



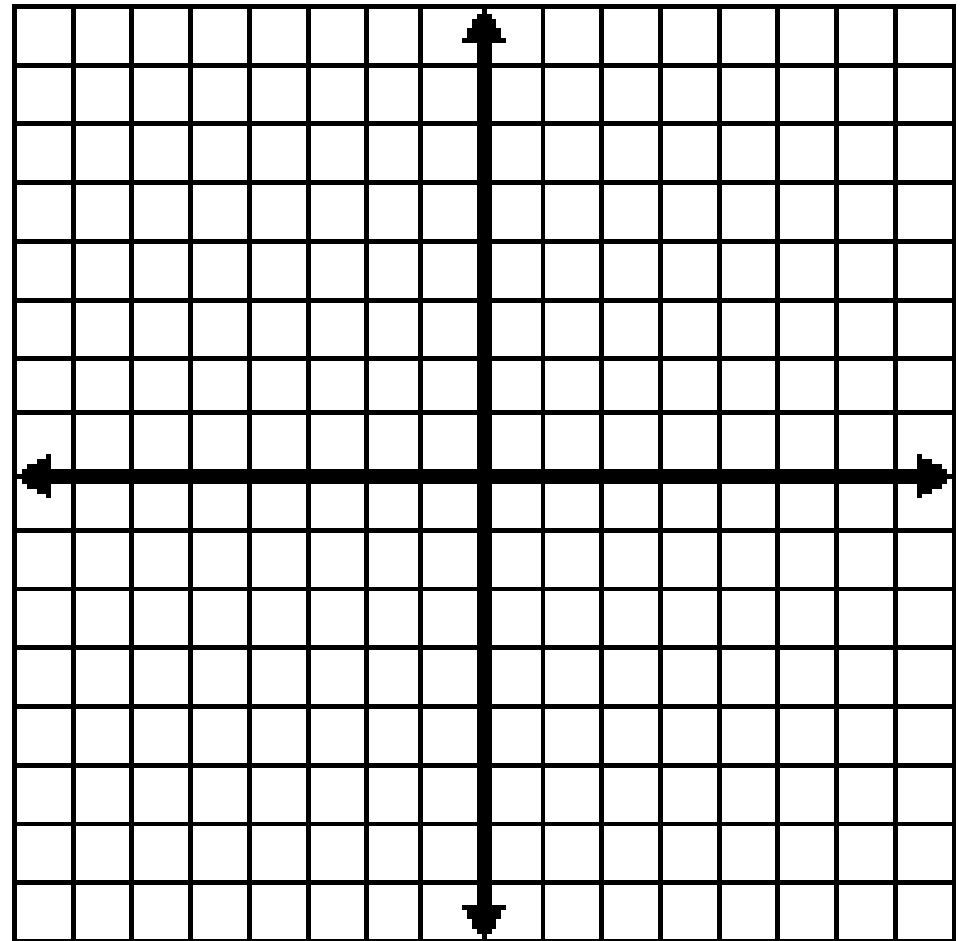
Steps to solving linear system using Graph & check:

- 1) Write equation in $y=mx + b$ form
- 2) Graph both equations on same coordinate plane
- 3) Estimate point of intersection coordinates
- 4) Check algebraically

Example: Solve the linear system graphically

$$y = 2x + 2$$

$$y = -x - 1$$



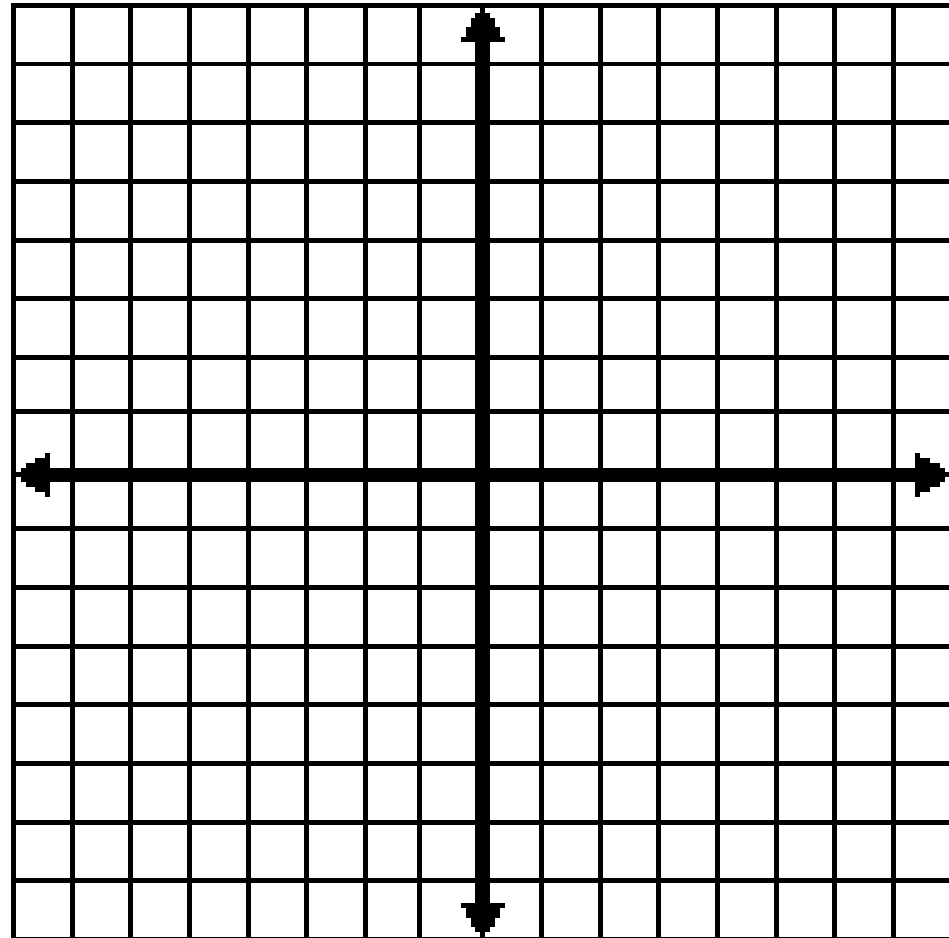


Checkpoint:

Solve the linear system graphically

$$x + y = -2$$

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



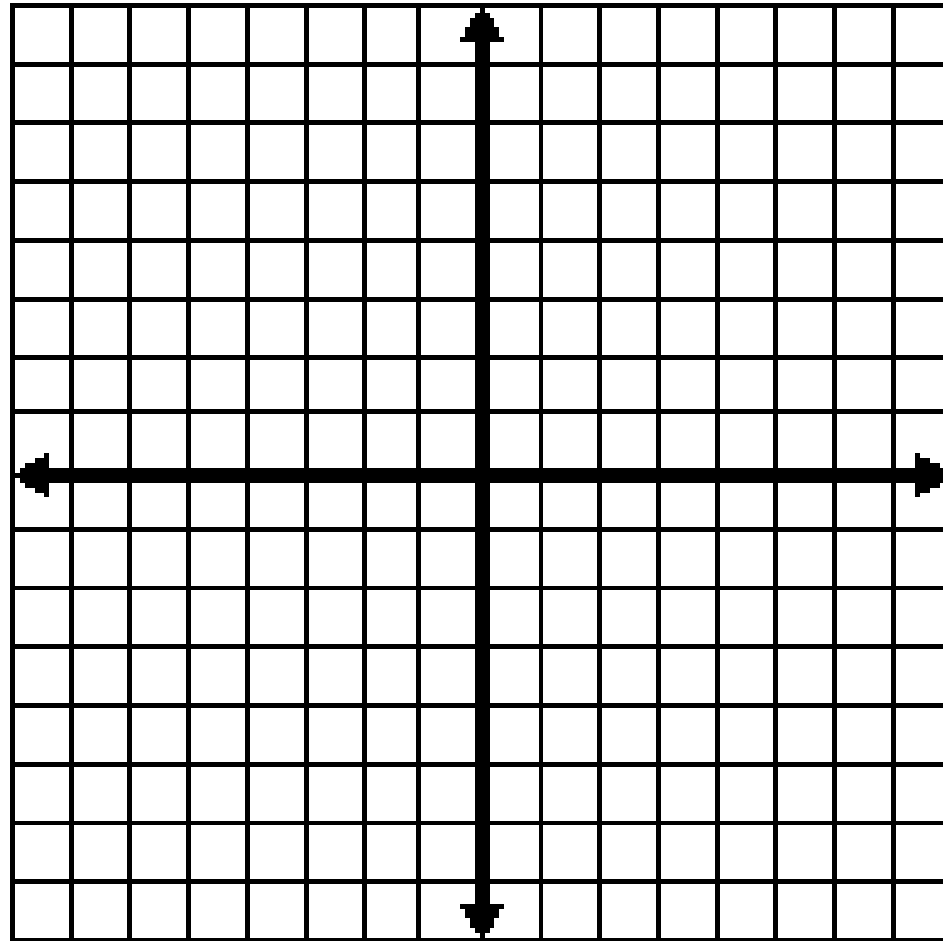


Number of Solutions of a Linear System

Example: Show that the linear system has no solution.

$$y = 2x - 1$$

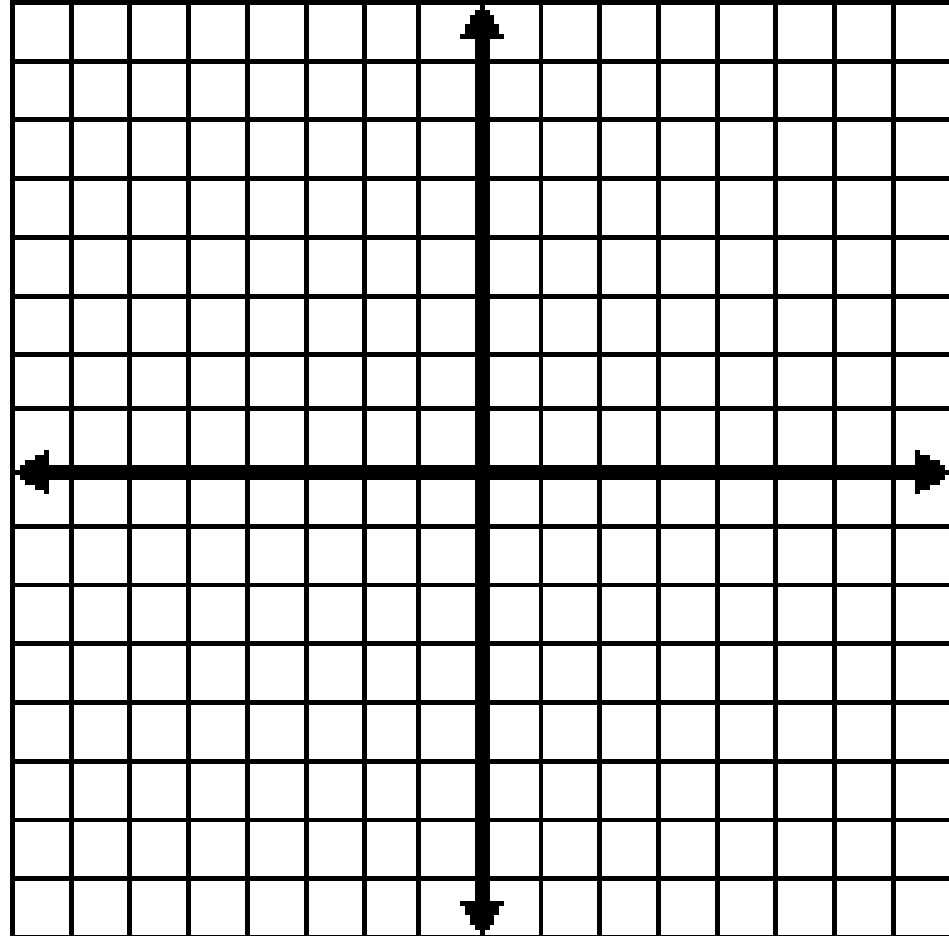
$$y = 2x + 3$$



Example: Show that the linear system has infinitely many solutions.

$$y = 3x - 2$$

$$y - 2x = x - 2$$





Homework:

p. 376 #5-16

****USE GRAPH PAPER****

6.3D Solve Systems of Equations by Substitution

I can...

Solve systems of equations using substitution method.

Substitution Steps:

- 1) Solve one equation for a variable
- 2) Substitute expression from step 1 into other equation and solve for other variable
- 3) Substitute value from step 2 into step 1 and solve
- 4) Check in original equation



Example: Solve the linear system.

$$y = x + 15$$

$$y = 4x$$



Example: Solve the linear system.

$$y = x + 1$$

$$y + x = 7$$

Example: Solve the linear system.

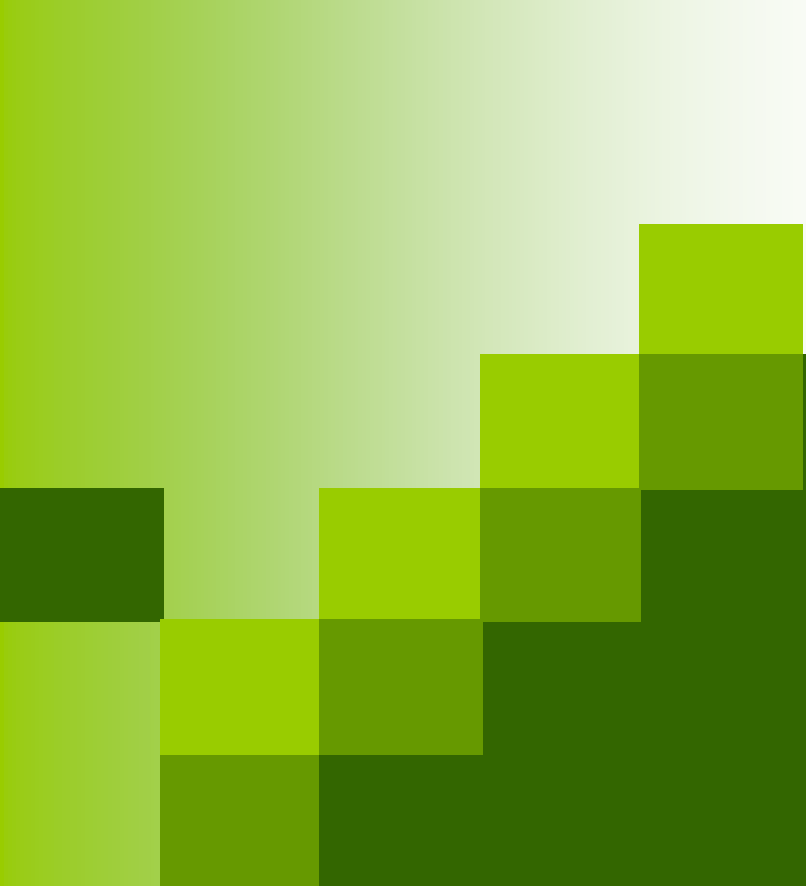
$$x + \frac{1}{2}y = 15$$

$$x = y - 6$$



Homework:

p. 380 #6-17, 23-25



System of Equations Project (TEST GRADE)