## Chapter 7: Systems of Equations and Inequalities Study Guide

## 7.1: Solve Systems of Equations by Graphing:

- Be able to identify an ordered pair as a solution to a system

$$
\text { Ex: Is }(5,2) \text { a solution to the system: } \quad \begin{aligned}
2 x-3 y & =4 \\
2 x+8 y & =11
\end{aligned}
$$

- Be able to find a solution to a system of equations by graphing

Ex: Solve the system by graphing:

$$
\begin{aligned}
& 2 y-4 x=12 \\
& 6 x+12 y=-6
\end{aligned}
$$



## 7.2: Solve Systems of Equations by Substitution:

- Be able to solve a system of equations by substitution
Ex: $y=x-2$
$x=17-4 y$
Ex: $5 x+2 y=9$
$x+y=-3$

$$
\text { Ex: } \begin{aligned}
y & =x-4 \\
y & =18+2 x
\end{aligned}
$$

- Be able to write a linear system and solve

Ex: During a football game the parents of the football players sell pretzels and popcorn to raise money for new uniforms. They charge $\$ 2.50$ for a bag of popcorn and $\$ 2$ for a pretzel. The parents collect $\$ 336$ in sales during the game and sell twice as many bags of popcorn as pretzels. How many bags of popcorn do they sell? How many pretzels?

## 7.3-7.4 Solve Systems of Equations by Eliminating a Variable:

- Be able to add or subtract equations to eliminate a variable in order to solve a system
Ex: $4 x-3 y=5$
$-2 x+3 y=-7$
Ex: $\begin{aligned} 6 x-4 y & =14 \\ 3 x-4 y & =1\end{aligned}$

Ex: $\begin{aligned} & 3 x+4 y=-6 \\ & 2 y=3 x+6\end{aligned}$
$2 y=3 x+6$

- Be able to multiplying equations first, then eliminate a variable, in order to solve a system
Ex: $\begin{aligned} x+y & =2 \\ 2 x+7 y & =9\end{aligned}$
$2 x+7 y=9$
Ex: $4 x-3 y=8$
$5 x-2 y=-11$


## 7.5: Special Types of Linear Systems:

- Be able to identify when a system of equations has one solution, no solution or infinite solutions by solving using any method.

Ex: Solve by graphing:

$$
\begin{aligned}
& 3 x+2 y=10 \\
& y=-\frac{3}{2} x+1
\end{aligned}
$$



Ex: Solve by substitution:

$$
\begin{aligned}
& x-2 y=-4 \\
& y=\frac{1}{2} x+2
\end{aligned}
$$

Ex: Solve by elimination:

$$
\begin{aligned}
& 2 x-3 y=6 \\
& 2 x-3 y=-4
\end{aligned}
$$

- Be able to identify the number of solutions to system without actually solving it

$$
\begin{aligned}
\text { Ex: } 5 x+3 y & =6 & \text { Ex: } y=2 x-4 \\
-5 x-3 y & =3 & -6 x+3 y=-12
\end{aligned}
$$

## 7.6: Solve Systems of Linear Inequalities:

- Be able to identify a solution to a system of linear inequalities

Ex: Is $(2,1)$ a solution?


Ex: Is $(-2,0)$ a solution?


- Be able to graph a system of linear inequalities and identify solutions

$$
\text { Ex: } \begin{aligned}
& x<8 \\
& x-4 y \leq-8
\end{aligned}
$$

Ex: $x \geq 0$
$y \geq 0$

$$
6 x-y<10
$$




- Be able to write a system of linear inequalities given the graph
Ex:


Ex:


## Extra Practice:

## Where to find:

- Page 441: 1 - 9
- Page 450: 50 - 52
- Page 457: 1 - 12
- Page 471-472: 36-41
- Page 472: 48 - 53, 1 - 9
- Page 473: 1 - 7
- Page 475-479:


## Topics Covered:

Graphing/Substitution
Graphing
Elimination
Systems of Inequalities Word Problems

Special Types of Systems
Graphing Systems of Inequalities
Systems Practice (General)
Word problem practice
Entire Chapter Review/Test

