Assignment Self-Monitoring Sheet

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: 9/18 Topic: Movie Ticket Analysis	0 1 2	
Tuesday Date: 9/19 Topic: HowOld.net Analysis	0 1 2	
Wednesday Date: 9/20 Topic: No homework - yesterday was a quiz.	0 1 2	
Thursday Date: 9/21 Topic: Pre Read: Ch. 19 Section A	0 1 2	
Friday Date: _____ Topic: _____	0 1 2	

Warm-up:

What did you learn when you read Chapter 19 Section A?

A Chapter 19 **GRAPHICAL SOLUTION**

Certain solutions of lines

types of lines parallel

#of solutions

How do we graph lines?

1 Method: Plot y-intercept, use gradient to find another point

Class Plan

1. Warm-up
2. Graphing Systems of Equations (Textbook 19A)
   *What does a solution look like?
3. Joke Break :)
4. Practice

Recall Prior Knowledge...

F Chapter 8 **GRAPHING LINES FROM EQUATIONS**

GRAPHING LINES IN GRADIENT-INTERCEPT FORM

To draw the graph of $y = mx + c$ we:

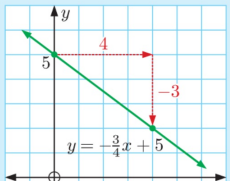
- Use the y-intercept c to plot the point $(0, c)$.
- Use x and y-steps from the gradient m to locate another point on the line.
- Join the two points and extend the line in either direction.

Example 14 Sel

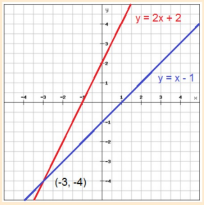
Draw the graph of $y = -\frac{3}{4}x + 5$.

For $y = -\frac{3}{4}x + 5$:

- the y-intercept is $c = 5$
- the gradient is $m = \frac{-3}{4}$ ← y-step, ← x-step



If we graph two lines (equations), what could it look like?



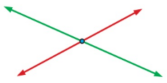
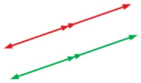
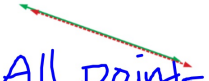
Find the intersection!

Do lines always intersect?

A Chapter 19 **GRAPHICAL SOLUTION**

One way to solve simultaneous equations is to draw the graph of both equations on the same set of axes
The **point of intersection** corresponds to a solution to the simultaneous equations.

A set of two linear simultaneous equations can have either one, zero, or infinitely many solutions.

intersecting lines	**parallel lines**	**coincident lines**
		 All points
one solution	no solutions	infinitely many solutions

$\begin{cases} y = 2x + 3 \\ y = -x + 9 \end{cases}$ Solution (2, 7)

$\begin{cases} y = \frac{3}{4}x + 3 \\ y = \frac{3}{4}x + 9 \end{cases}$ Same slopes!

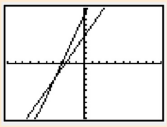
$\begin{cases} 2y = -6x + 8 \\ y = -3x + 4 \end{cases}$ Same equation!

Solving System of Equations

3 Possible Types of Solutions

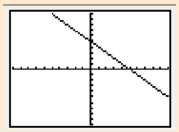
1. One Solution

One intersection on the graph



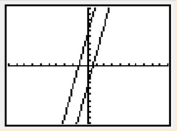
2. Infinite Solutions

Uncountable intersections on the graph



3. No Solution

No intersection on the graph



Solving System of Equations

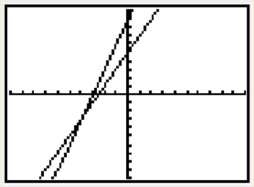
3 Possible Types of Solutions

1. One Solution

One intersection on the graph

$y = 2x + 5$
$y = 3x + 9$

ex. $x = -4, y = -3$



Solving System of Equations

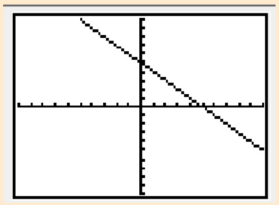
3 Possible Types of Solutions

2. Infinite Solutions

Uncountable intersections

$y = -x + 5$
$y = 5 - x$

TRUE statement is result ex. 0 = 0.



Solving System of Equations

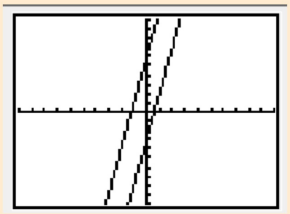
3 Possible Types of Solutions

3. No Solution

No intersection on the graph

$y = 5x - 3$
$y = 5x + 6$

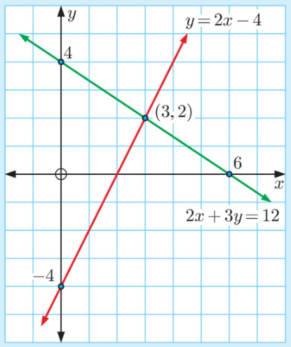
FALSE statement is the result ex. 9 = 0.



A Chapter 19 **GRAPHICAL SOLUTION**

Example 1

Solve the following simultaneous equations graphically: $\begin{cases} y = 2x - 4 \\ 2x + 3y = 12 \end{cases}$



We draw the graphs of $y = 2x - 4$ and $2x + 3y = 12$ on the same set of axes.

The graphs meet at the point $(3, 2)$.

$\therefore$ the solution is $x = 3$, $y = 2$.

Check:

Substituting these values into:

- $y = 2x - 4$ gives $2 = 2(3) - 4$ ✓
- $2x + 3y = 12$ gives $2(3) + 3(2) = 12$ ✓

Joke Break :)

(x+2)(x−1)

Parallel lines have so much in common...

it's a shame that they'll never meet.

PLAN

(P+L)(A+N)

PA+PN+LA+LN

Your plan has been foiled

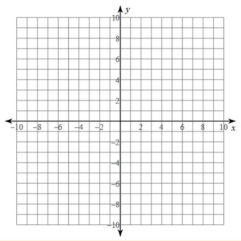
Investigation:

A GRAPHICAL SOLUTION

Solutions to Systems of Equations

*Identify gradient/slope (m) & y-intercept (c)
*Graph equations
*Find intersection(solution)!

Directions: Graph the following systems of equations.



$$\begin{cases} y = \frac{1}{3}x - 1 \\ y = -2x + 6 \end{cases}$$

Line 1:
Gradient: _____
Y-Intercept: _____

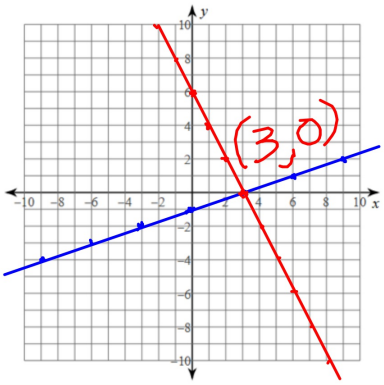
Line 2:
Gradient: _____
Y-Intercept: _____

Solution: _____

Done? Show teacher and start practice

A Investigation **GRAPHICAL SOLUTION**

Directions: Graph the following systems of equations.



$$\begin{cases} y = \frac{1}{3}x - 1 \quad ① \\ y = -2x + 6 \quad ② \end{cases}$$

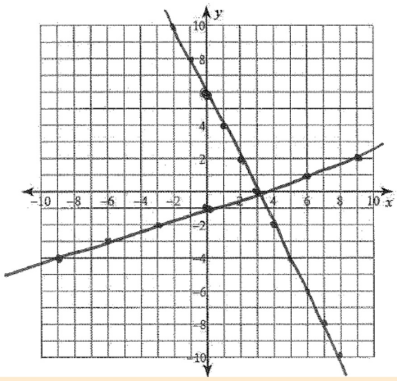
Line 1:
Gradient: $\frac{1}{3}$ UP 1 / RT 3
Y-Intercept: -1

Line 2:
Gradient: $\frac{-2}{1}$ DN 2 / RT 1
Y-Intercept: 6

Solution: (3, 0)

A Solution GRAPHICAL SOLUTION

Directions: Graph the following systems of equations.



$$\begin{cases} y = \frac{1}{3}x - 1 \ (1) \\ y = -2x + 6 \ (2) \end{cases}$$

Line 1:
Gradient: 1/3 up 1 right 3

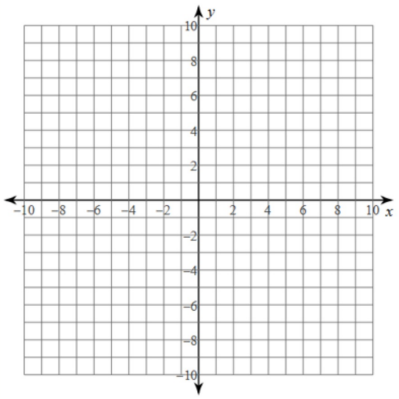
Y-Intercept: −1

Line 2:
Gradient: −2 down 2 / right 1

Y-Intercept: 6

Solution: (3, 0)

A Investigation GRAPHICAL SOLUTION



Graph both equations.

$$\begin{cases} y = -\frac{2}{5}x + 1 \\ y = -\frac{2}{5}x - 3 \end{cases}$$

Line 1:
Gradient: _____

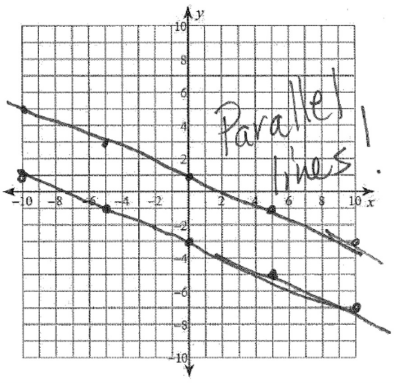
Y-Intercept: _____

Line 2:
Gradient: _____

Y-Intercept: _____

Solution: _____

A Solution GRAPHICAL SOLUTION



Graph both equations.

$$\begin{cases} y = -\frac{2}{5}x + 1 \ (1) \\ y = -\frac{2}{5}x - 3 \ (2) \end{cases}$$

Line 1:
Gradient: $-\frac{2}{5} = \frac{\text{dr2}}{\text{r5}} = \frac{\text{up2}}{\text{left5}}$

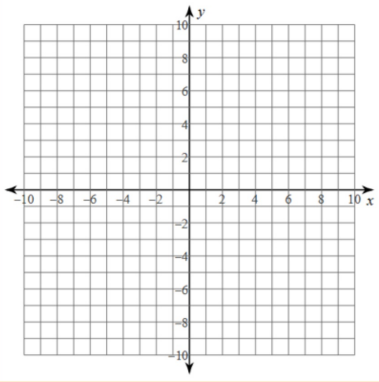
Y-Intercept: 1

Line 2:
Gradient: $-\frac{2}{5}$

Y-Intercept: -3

Solution: NO SOLUTION

A Investigation GRAPHICAL SOLUTION



Graph both equations.

$$\begin{cases} y = 2x + 4 \\ -2x + y = 4 \end{cases}$$

Line 1:
Gradient: _____

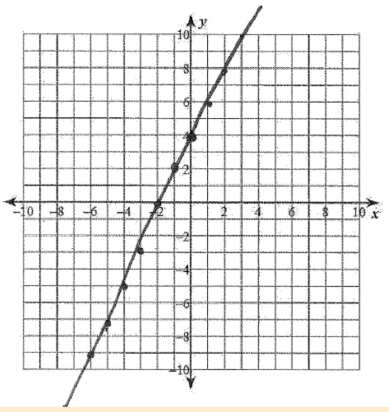
Y-Intercept: _____

Line 2:
Gradient: _____

Y-Intercept: _____

Solution: _____

A Solution GRAPHICAL SOLUTION



Graph both equations.

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

Line 1:
Gradient: 2 (up 2 / r+1)

Y-Intercept: 4

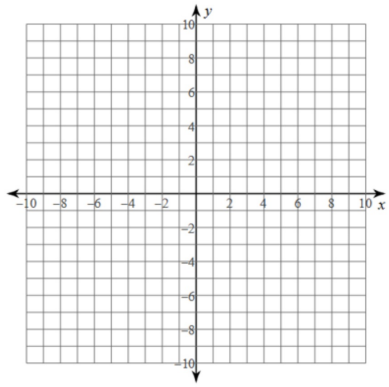
Line 2:
Gradient: 2 (down 2 / left 1)

Y-Intercept: 4

Solution: All points on the line

A Investigation GRAPHICAL SOLUTION

Challenge Problem!



Graph both equations.

$$\begin{cases} x + 2y = 6 \\ 5x + 2y = -2 \end{cases}$$

Line 1:
Gradient: _____

Y-Intercept: _____

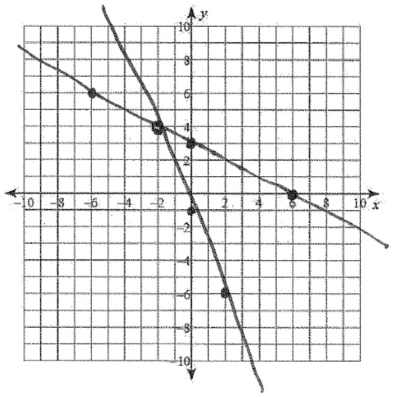
Line 2:
Gradient: _____

Y-Intercept: _____

Solution: _____

A Solution **GRAPHICAL SOLUTION**

Challenge Problem!



Using intercepts

Graph both equations.

$\begin{cases} x+2y=6 \\ 5x+2y=-2 \end{cases}$ $x=6, y=3$ $x=-\frac{2}{5}$ $y=-1$

$y=-\frac{5}{2}x-1$

Line 1:

Gradient: _____

Y-Intercept: _____

Line 2:

Gradient: _____

Y-Intercept: _____

Solution: $(-2,4)$

A Chapter 19 **GRAPHICAL SOLUTION**

19A.1 (Page 375)
Exercises: #1 and #3

EXERCISE 19A.1

1 Solve the following simultaneous equations graphically:

a $\begin{cases} y=4x-1 \\ y=2x-3 \end{cases}$ b $\begin{cases} y=3x \\ y=-2x+5 \end{cases}$ c $\begin{cases} y=x+2 \\ y=-3x-6 \end{cases}$

Slope –

y-int –

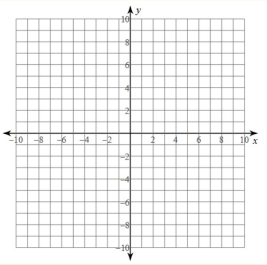
3 Try to solve the following simultaneous equations graphically. State the number of solutions in each case.

a $\begin{cases} y=4x+1 \\ y=4x-3 \end{cases}$ b $\begin{cases} x-\frac{1}{2}y=-3 \\ y=2x+6 \end{cases}$ c $\begin{cases} 5x+3y=2 \\ 5x+3y=-7 \end{cases}$

EXERCISE 19A.1

1 Solve the following simultaneous equations graphically:

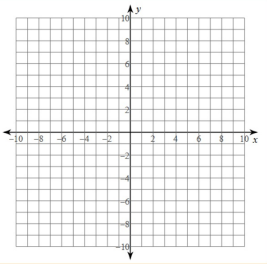
a $\begin{cases} y = 4x - 1 \\ y = 2x - 3 \end{cases}$ **b** $\begin{cases} y = 3x \\ y = -2x + 5 \end{cases}$ **c** $\begin{cases} y = x + 2 \\ y = -3x - 6 \end{cases}$



A Chapter 19 GRAPHICAL SOLUTION

3 Try to solve the following simultaneous equations graphically. State the number of solutions in each case.

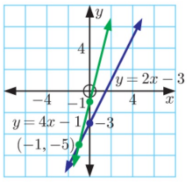
a $\begin{cases} y = 4x + 1 \\ y = 4x - 3 \end{cases}$ **b** $\begin{cases} x - \frac{1}{2}y = -3 \\ y = 2x + 6 \end{cases}$ **c** $\begin{cases} 5x + 3y = 2 \\ 5x + 3y = -7 \end{cases}$



A SOLUTIONS! GRAPHICAL SOLUTION

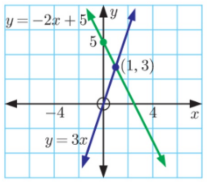
EXERCISE 19A.1

1 a



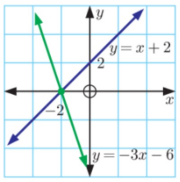
$x = -1, \quad y = -5$

b



$x = 1, \quad y = 3$

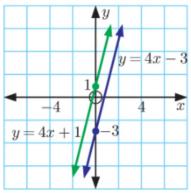
c



$x = -2, \quad y = 0$

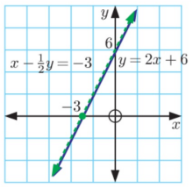
A SOLUTIONS! GRAPHICAL SOLUTION

3 a



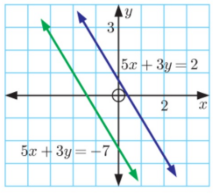
No solutions, the lines are parallel.

b



Infinitely many solutions, the lines are coincident.

c



No solutions, the lines are parallel.