

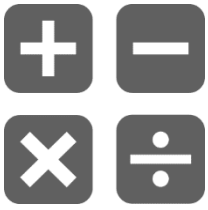


**Mastery  
Worksheets**

**MAT 1033**

## Test 2

- Literal Equations
- Linear Inequalities in One Variable
- Compound Inequalities
- Systems of Equations in Two Variables
- Linear Inequalities in Two Variables



# Mastery Worksheet

# MAT 1033

MY NAME IS:

## Literal Equations

Test 2  
Worksheet 4

Practice Session #

Date:

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**Literal equations**, are equations containing several variables. To solve literal equations, you must be proficient at solving equations of one variable. The next few exercises will help you refresh your knowledge of solving linear equations.

Let's get to work...

Solve.

# 1

$$2(x-3)+5=10$$

# 2

$$2+3(x-5)=15$$

# 3

$$4z+2-3z+5=3+z+4$$

# 4

$$\frac{2y-9}{10} + \frac{3}{2} = y$$

To solve a literal equation, use all the same rules you use to solve an equation in one variable.

# 5

Solve for  $W$ :  $P = 2L + 2W$

# 6

Solve for  $x$ :  $y = \frac{2}{3}x + 5$

7

Solve for  $h$ :  $V = \frac{1}{3}\pi r^2 h$

8

Solve for  $y$ :  
 $2(x-3) + 3y = 5y - 2(3-5x)$

How do I feel?

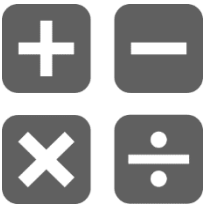
Awesome!  
I Aced it!

Easy

Medium

Hard

I need help with...



# Mastery Worksheet

# MAT 1033

MY NAME IS:

## Linear Inequalities in One Variable

Test 2  
Worksheet 5

Practice Session #

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A **linear inequality in one variable** is any expression that can be written as:

$Ax + B > C$

$Ax + B \geq C$

$Ax + B < C$

$Ax + B \leq C$

(where  $A \neq 0$ )

Solutions to linear inequalities are typically given in **interval notation**.

Square brackets [ ] mean the value is included in the interval.

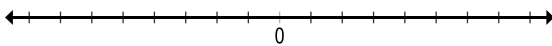
Parentheses ( ) mean the value is not included in the interval.

Let's get to work...

Graph the expression and write in interval notation. Label your graph.

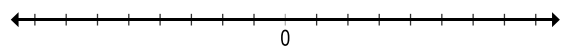
# 1

$x > 5$



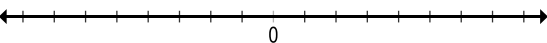
# 2

$x \geq 7$



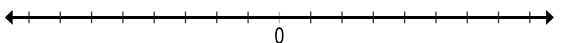
# 3

$x < 6$



# 4

$x \leq -2$



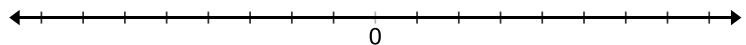
Solving linear inequalities in one variables is similar to solving linear equations in one variable with one exception.

**When you multiply or divide by a negative number you must flip the sign.**

Solve, graph the solution set, and write the answer in interval notation.

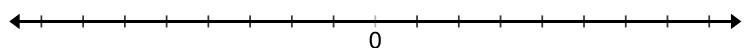
# 5

$2y + 6 < 4$



# 6

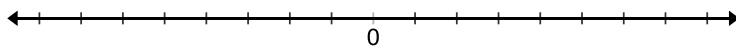
$3 - 4(y + 2) \geq 6 + 4(2y + 1)$



Test 2 | Linear Inequalities in One Variable  
Worksheet 5

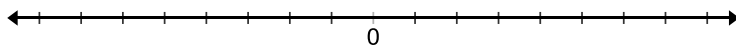
7

$$-2x - 5 \leq -25$$



8

$$-\frac{2}{3}b - \frac{1}{3} > \frac{1}{2}b$$



How do I feel?

Awesome!  
I Aced it!



Easy

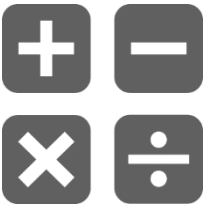


Medium



Hard

I need help with...



# Mastery Worksheet

# MAT 1033

MY NAME IS:

## Compound Inequalities

Test 2  
Worksheet 6

Practice Session #

Date:

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The **union** of two sets, A **or** B, is the set of elements containing elements from A or from B.

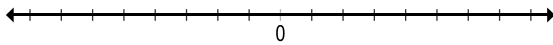
The **intersection** of two sets, A **and** B, is the set of elements that A and B have in common.

Let's get to work...

Solve, graph the solution set, and write your answer in interval notation.

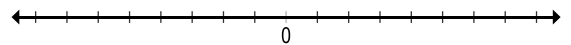
# 1

$$x < 5 \text{ and } x \geq -1$$



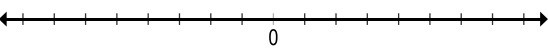
# 2

$$x \geq 2 \text{ and } x < -3$$



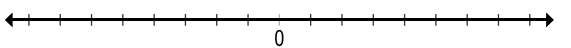
# 3

$$x < 2 \text{ and } x \geq 3$$



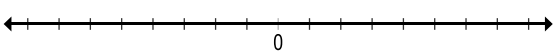
# 4

$$x < 5 \text{ or } x \geq -1$$



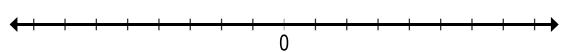
# 5

$$x \leq -1 \text{ or } x \geq 4$$



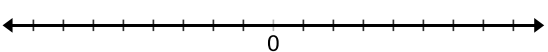
# 6

$$5(x-1) \geq -5 \text{ or } 5-x \leq 10$$



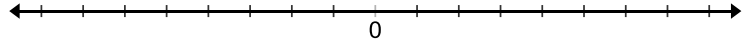
# 7

$$x+5 > -2 \text{ and } 4x < 28$$



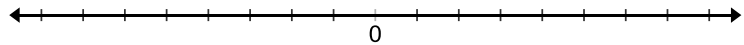
8

$$-1 < -2x + 4 \leq 7$$



9

$$-\frac{2}{3} < \frac{x-4}{-6} < \frac{2}{3}$$



How do I feel?

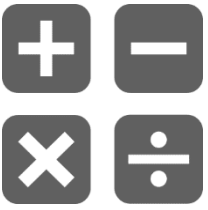
Awesome!  
I Aced it!

Easy

Medium

Hard

I need help with...



# Mastery Worksheet

# MAT 1033

MY NAME IS:

## Systems of Equations in Two Variables

Test 2  
Worksheet 7

Practice Session #

Date:

/ /

In solving a linear system of equations, we want to determine the ordered pair that two equations have in common.

There are only *three possibilities* when solving a system of linear equations:

- Exactly **one solution** (consistent, independent)
- **Infinitely many solutions** (consistent, dependent)
- **No solution** (inconsistent independent)

### Let's get to work...

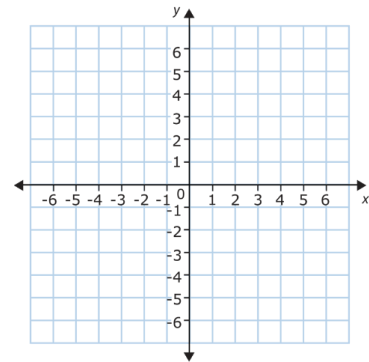
To solve a system of equations by graphing, first graph the equations then determine the point they have in common.

#### Solve by graphing.

# 1

$$y = 2x + 5$$

$$y = -x + 2$$



To solve a system using the **substitution method**:

- **Step 1:** Solve for a variable in one equation in terms of the other variable.
- **Step 2:** Substitute the solution from Step 1 into the other equation and solve the resulting equation.
- **Step 3:** Find the second variable by substituting the solution from Step 2 into one of the original equations and solve the resulting equation to find the second variable.

#### Solve the system using the substitution method.

# 2

$$2x + y = 2$$

$$5x - 3y = 4$$



# Test 2 | Systems of Equations in Two Variables

## Worksheet 7

3  $2x + 3y = 8$   
 $2y - 3x = 5$

To solve a system using the **addition method**:

- **Step 1:** Rewrite both equations in the form .
- **Step 2:** Multiply one or both equations by a nonzero constant to obtain variables in both equations with coefficients of opposite value.
- **Step 3:** Add both equations on the left and right to eliminate one variable.
- **Step 4:** Substitute the solved variable into one of the original equations and solve for the other variable.

**Solve the system using the addition method.**

4  $6x - 2y = 3$   
 $2x + 3y = -5$

5  $2x = 7 - 8y$   
 $7y + 3x = 9$

How do I feel?

**Awesome!**  
I Aced it!

  
Easy

  
Medium

  
Hard

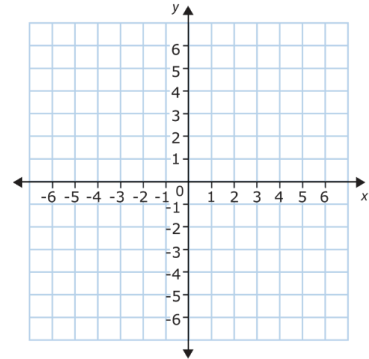
I need help with...

# Test 2 | Systems of Equations in Two Variables

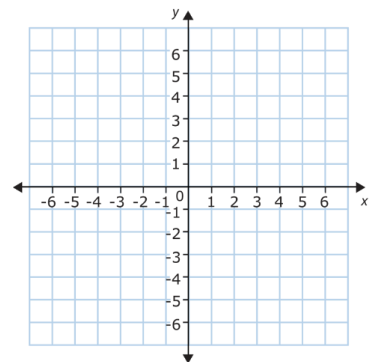
## Worksheet 7

Solve using the addition or substitution method. Graph to check the answer.

**6**  $2x + 4y = 8$   
 $x = 3 - 2y$



**7**  $2x + 4y = 8$   
 $x + 2y = 4$



**8** A small theater with 200 seats sells two kinds of tickets for a performance. Premium tickets sell for \$20 each and Standard tickets sell for \$15 each. At a sold-out performance, \$3400 was collected in ticket sales. How many tickets of each type were sold?

How do I feel?

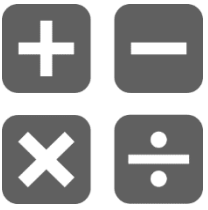
**Awesome!**  
I Aced it!

  
Easy

  
Medium

  
Hard

I need help with...



# Mastery Worksheet

# MAT 1033

MY NAME IS:

## Linear Inequalities in Two Variables

Test 2  
Worksheet 8

Practice Session #

Date:

/ /

To solve a linear inequality in two variables:

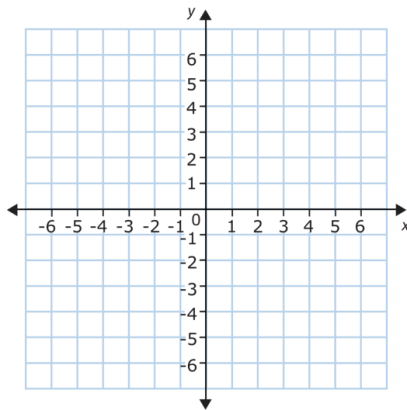
- **Step 1:** Solve for  $y$  when possible.
- **Step 2:** If  $<$  or  $>$  are used, graph a dotted line. If  $\leq$  or  $\geq$  are used, graph a solid line.
- **Step 3:** If  $y > mx + b$  or  $y \geq mx + b$  shade above the line. If  $y < mx + b$  or  $y \leq mx + b$  shade below the line.
- **Step 4:** If the inequality is only in  $x$ , solve for  $x$ . Shade to the left of the vertical line if  $x < a$  or  $x \leq a$ .  
Shade to the right of the vertical line if  $x > a$  or  $x \geq a$ .

Let's get to work...

Graph the solution set.

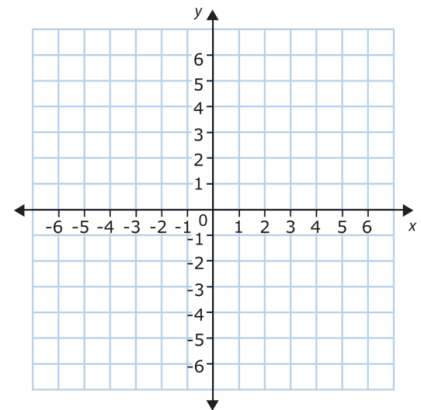
# 1

$$y \leq 2x + 3$$



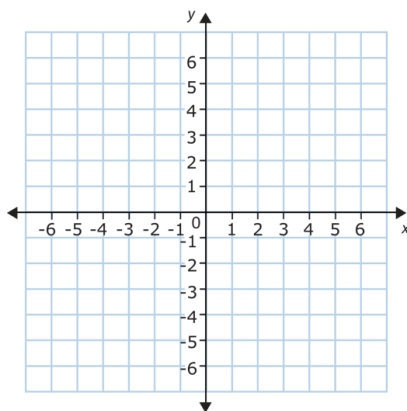
# 2

$$y + 2x > 5$$



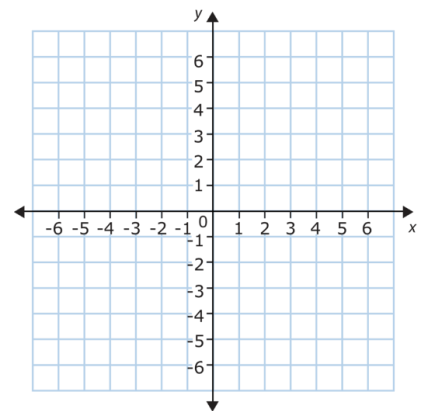
# 3

$$2x - 10 \geq -2$$



# 4

$$-3y + 1 > 10$$



# Test 2 | Linear Inequalities in Two Variables

## Worksheet 8

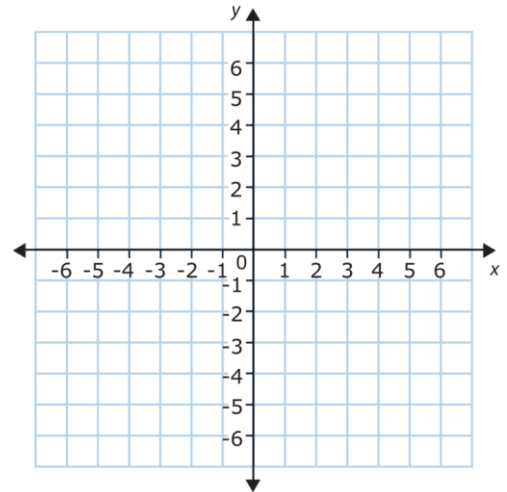
The **union** of two sets, A **or** B, is the set of elements containing elements from A or from B.

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### Graph the solution set.

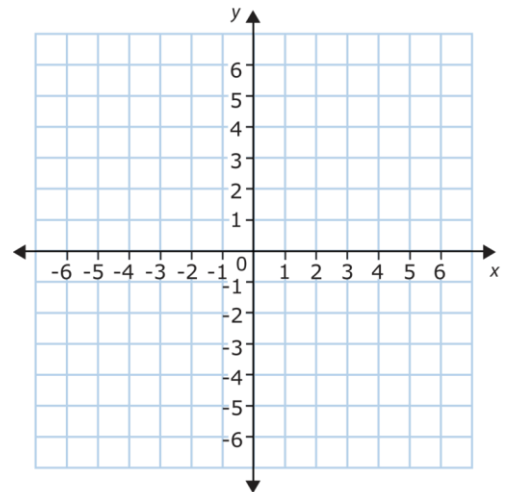
# 5

$$2x + y < 5 \text{ and } y - 3x < 1$$



# 6

$$x \geq 2 \text{ or } 2 - y \leq x$$



How do I feel?

**Awesome!**  
I Aced it!

  
Easy

  
Medium

  
Hard

I need help with...