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Bell Work

Directions: Please solve by extracting the root. Give an exact answer and an estimated answer rounded to the hundredth.

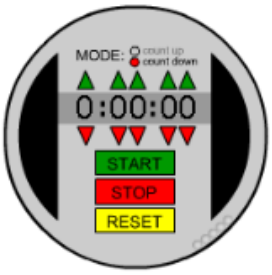
1. $2x^2+1=13$

2. $\frac{2(x-4)^2}{2}=\frac{20}{2}$

$(x-4)^2=10$

$x-4=\pm\sqrt{10}$

$x=4\pm\sqrt{10}$



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Objectives

1. The students will solve quadratic inequalities in 1 variable.

2. The students will solve and graph quadratic inequalities in 2 variables.

Some Reminders

1. When we divide both sides of an inequality by a negative, we need to flip the sign.

2. When we graph > or < we use a(n) open dot.

3. When we graph ≥ or ≤ we use a(n) closed dot.

4. When we graph a < or > inequality in two variables we use a dotted line.

5. When we graph a ≤ or ≥ inequality in two variables we use a solid line.

Example

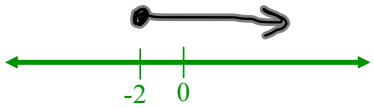
$-x^2+6x+1<0$

$-1 \quad -1$

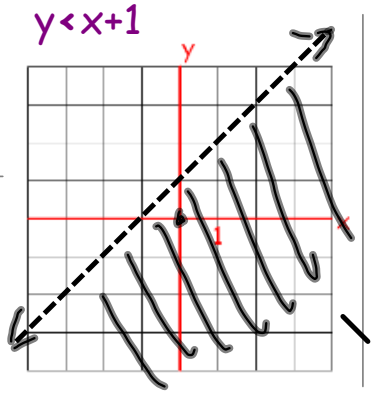
$x^2-6x-1>0$

$x<5$

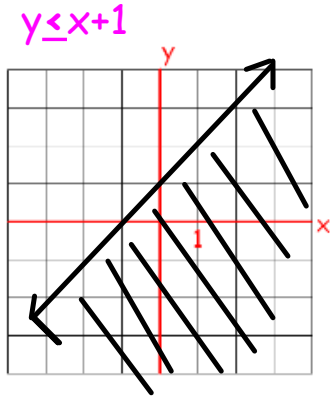
$x \geq -2$



$y<x+1$



$y \leq x+1$



Discovery-This is WHY we do it

Directions: Please evaluate the following for your value of x and determine if it is a solution for the inequality.

1. $x^2-2x-8<0$

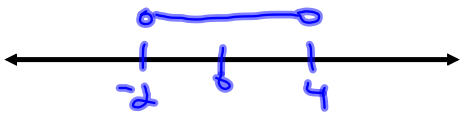
$x^2-2x-8=0$

$(x-4)(x+2)=0$

$x-4=0 \quad x+2=0$

$x=4 \quad x=-2$

	$x=4$	$x+2$	
100	+	+	+ F
0	−	+	− T
−100	−	−	+ F



2. $4x^2-9>0$

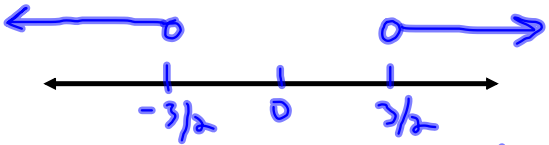
$4x^2-9=0$

$(2x+3)(2x-3)=0$

$2x+3=0 \quad 2x-3=0$

$2x=-3 \quad 2x=3$

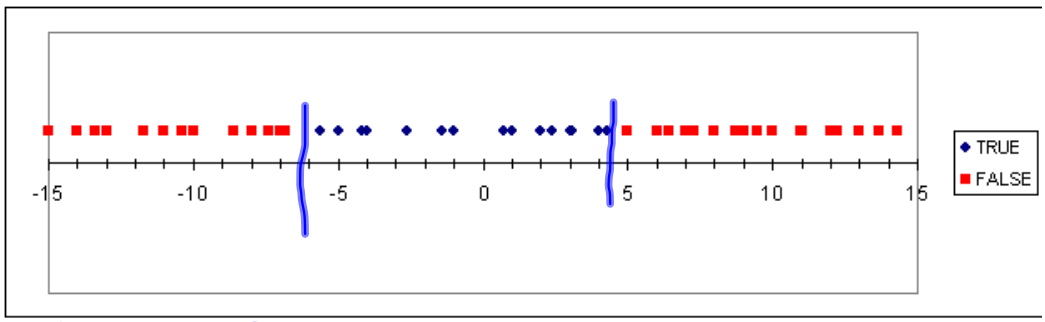
$x=-3/2 \quad x=3/2$

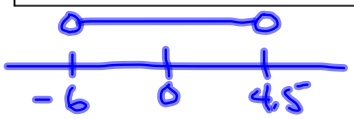


x	$2x+3$	$2x-3$	
∞	+	+	+ T
0	+	−	− F
−∞	−	−	+ T

Quadratic Inequalities Period One

Quadratic Inequalities Period Two





$2x^2+3x-54<0$

$2x^2+3x-54=0$

$2x^2$	-54	$3x$
$2x$	6	$12x$
x	-9	$-9x$

$(2x-9)(x+6)=0$

$2x-9=0$ $\quad x+6=0$

$2x=9$ $\quad x=-6$

$x=4.5$

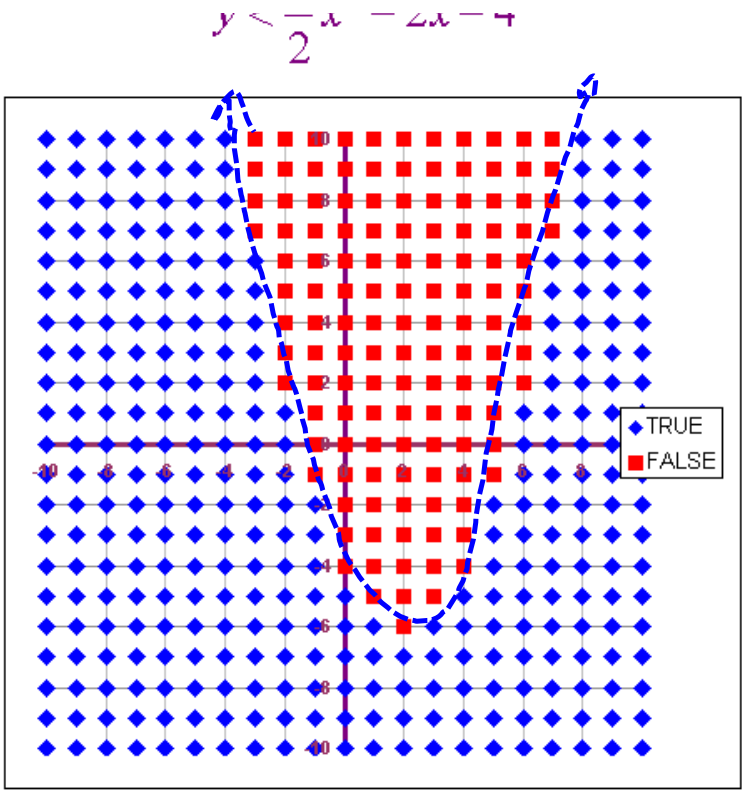
x	$2x-9$	$x+6$		
1000	$+$	$+$	$+$	F
0	$-$	$+$	$-$	T
-1000	$-$	$-$	$+$	F

Steps - This is HOW we do it - One Variable

1. Set the inequality equal to zero.
2. **Solve** the quadratic inequality
   - Factor with zero-product property
   - Quadratic Formula
3. Graph the critical points.
4. Pick three test points and evaluate them.
5. Graph the true portion on a number line.

Example 1. $x^2-5x-14<0$

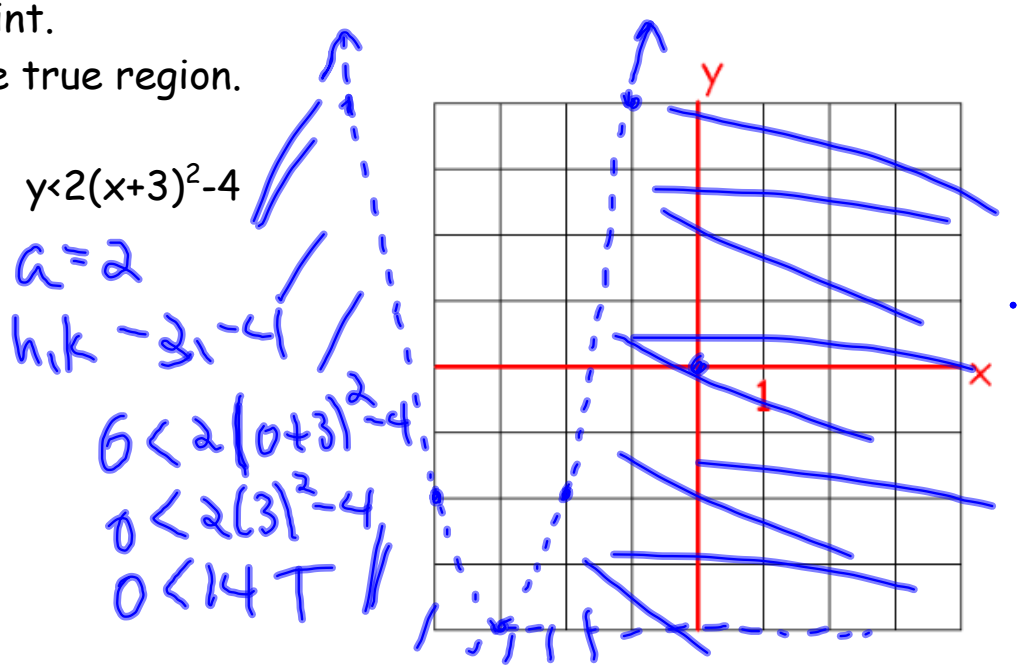
Example 2. $-2x^2+3<-x$


$y < \frac{1}{2}x^2 - 2x - 4$
TRUE
FALSE

Steps - This is HOW we do it - Two Variables

1. Graph the quadratic
   (vertex form or standard form)
2. Test a point.
3. Shade the true region.

Example 1 $y<2(x+3)^2-4$

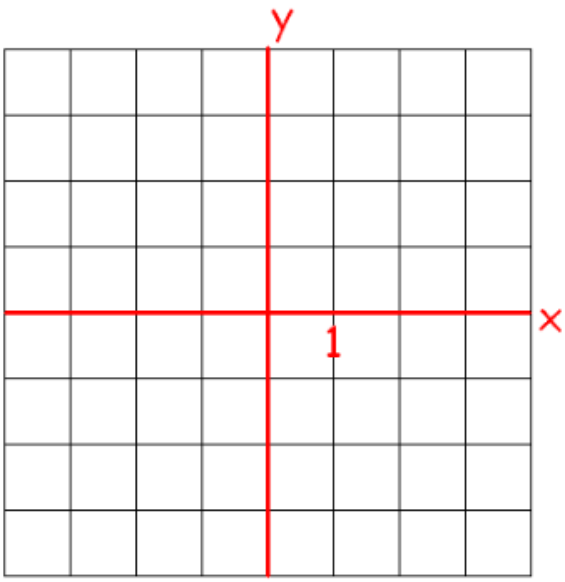


Steps - This is HOW we do it

1. Graph the quadratic
   (vertex form or standard form)
2. Test a point.
3. Shade the true region.

Exploration

Example 2 $y \geq x^2-2x-1$



Attachments

Exploration-Quadratic+Inqequalities+in+One+Variable_per1.xls

Exploration-Quadratic+Inqequalities+in+One+Variable_per2.xls

Quadratic Inequalities - Exploration.xls