reminder

Chapter 4 Test is next Wednesday

Pick Up The Purple half sheet and tape into today's notes

We'll go over yesterday's HW tomorrow but please let me know about questions now.

homework check

4.... 48-49, 53bc, 54

53

a $5 - 3\left(\frac{1}{2}x + 2\right) = -7$

b $5\left[\sqrt{x-2} + 1\right] = 15$

c $12 - \left(\frac{2}{3}x + x\right) = 2$

d $-3(2x+1)^3 = -192$

$(2x+1)^3 = 64$

54

Just observe

The AIM

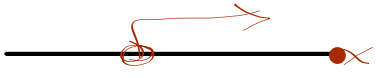
for the next few days...

1. Solve single variable inequalities
2. Graph two variable inequalities
3. Solve systems of two variable inequalities

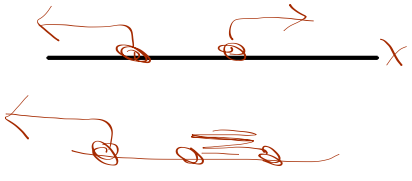
What will the solutions look like?

1. Solve single variable inequalities

$2x-1 \geq 7x^2-5$

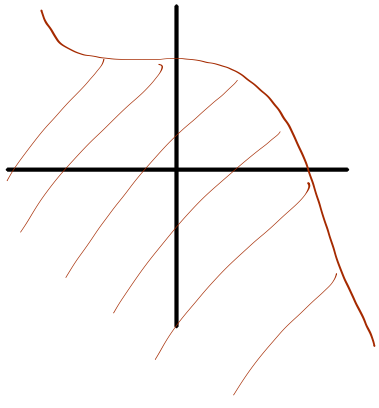


or perhaps



2. Graph two variable inequalities

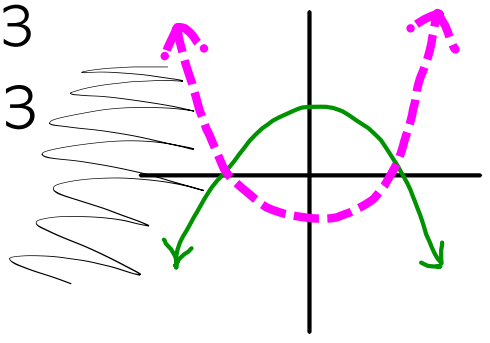
$x-2y > x+1$



3. Solve systems of two variable inequalities

$y \geq 2x^2+5x-3$

$y < x^2+4x+3$



AIM

Solve

single variable inequalities

SCHEDULE FOR TODAY:

HANDOUT

THEN NOTES

The Boundary Point Method
To solve more complicated Inequalities

1. Determine the boundary point or points.

   To do this, change the inequality to an equation. Then you can either:

   A. Solve the equation algebraically.

   or...

   B. Solve the equation graphically to determine the boundary points and to create regions.

2. Add the boundary points to a number line

3. Test a point in the original inequality in all regions, showing the details.

4. Based on the test, shade in the appropriate section(s) of the number line.

5. Write your final inequality, algebraically in an appropriate way.

1 Use the boundary Point method to solve the one variable inequality $2x-1 \geq 7$

b) Now solve the original inequality **2x-1 ≥ 7** algebraically to verify above.

$2x \geq 8$

$x \geq 4$

the "direct" way doesn't always work with all types of functions so the test point method is necessary.

2 **Use the *boundary method* to solve the one variable quadratic inequality $x^2 - 2x < 0$**

$x^2 - 2x = 0$

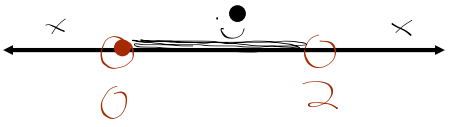
$x(x-2) = 0$

ZPP:

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

$x = 0$

boundary pts are $x = 0, x = 2$



TEST $x = -1$ $\quad (-1)^2 - 2(-1) < 0$

$1 + 2 < 0$ false

TEST $x = 1$ $\quad (1)^2 - 2(1) < 0$

$-1 < 0$ true

TEST $x = 3$ $\quad (3)^2 - 2(3) < 0$

$3 < 0$ false

$0 < x < 2$

notes

Solve single variable inequalities

(1 Variable)

The solutions to single variable inequalities can always be shown on a number line.

notes Example 1

Solve

$x^2-3x-10 \leq 0$

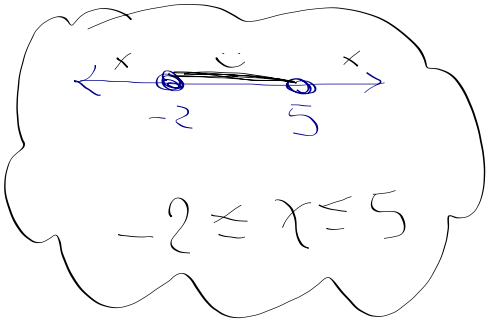
find boundary points

$x^2-3x-10=0$

$(x-5)(x+2)=0$

$x=5 \quad x=-2$

test



$-2 \leq x \leq 5$

test $x=-3$ $(-3)^2-3(-3)-10 \leq 0$
$9+9-10$
$8 \leq 0$ ✗

test $x=0$ $(0)^2-3(0)-10 \leq 10$
$-10 \leq 10$
✓

test $x=6$ $(6)^2-3(6)-10 \leq 0$
$36-18-10 \leq 0$
$8 \leq 0$ ✗

notes Example 1

Solve

$x^2-3x-10 \leq 0$

find boundary points

$x^2-3x-10=0$

$(x+2)(x-5)=0$

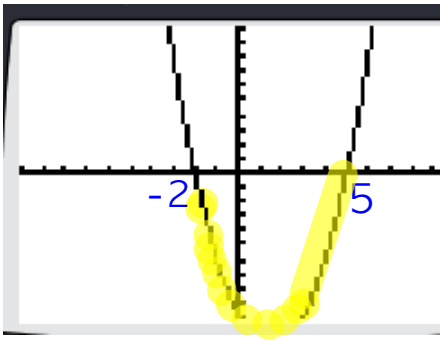
$x+2=0$ $\quad x+5=0$

$x=-2 \quad x=-5$

TEST IN all regions

Graphing Check

$x^2-3x-10 \leq 0$



$-2 \leq x \leq 5$

Example 2

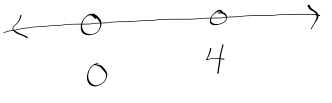
Solve $|2-x|-3<-5$ careful

$|2-x|-3=-5$
$+3 \quad +3$

$|2-x| = -2$

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

$x=4 \quad x=0$



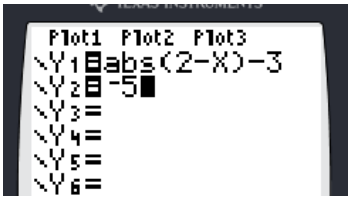
test $x=-1$ $|2-(-1)|-3<-5$
$|3|-3<-5$
$0<-5$ ∴

$x=1$ $|2-1|-3<-5$
$-2<-5$ ∴

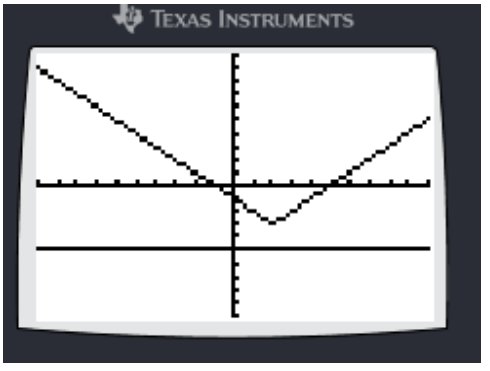
$x=10$ $|2-10|-3<-5$
$5<-5$ ∴

NO solution

Now check graphically



Solve $|2-x|-3 < -5$



example 3 on your own

$4|x+1|-2 > 6$

$x < -3$ OR $x > 1$

$-\infty < x < -3$

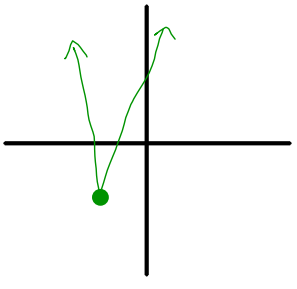
$-\infty < -3$, $1 < x < \infty$

Now Graphically (GDC) to check

$4|x+1|-2 > 6$

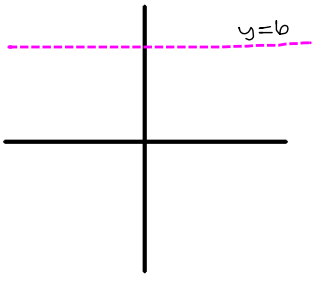
When are the y-values of

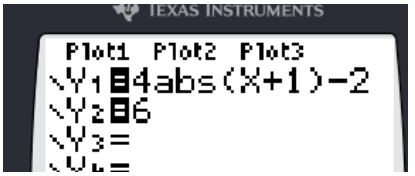
$4|x+1|-2$

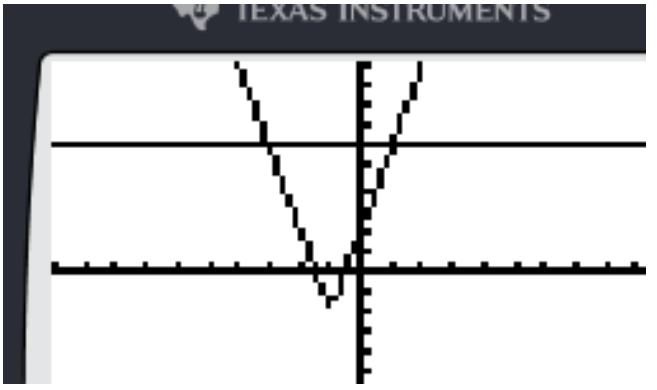


higher than the y-values of

6







Now solve the whole inequality algebraically

$$4|x+1|-2 > 6$$

Example 4

Solve $x^2-5>4x$ using the boundary point method

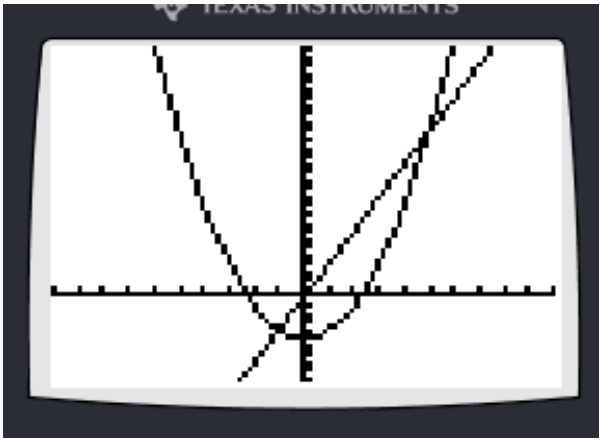
Boundary point(s)

Test

Solution

Now graphically

$x^2-5>4x$



assignment

4- 65, 66ab, 67, 68a, 69ac, 70

assignment

handout called "Assignment 4.2.1"

you will need your textbook, FYI

4. . . 65, 66ab, 67, 68a, 69ac, 70

10. . 101a

12. . 7bc

for tomorrow's class

(with sub)

1. LCQ (partner)

2. Work on Assignment