reminder

Chapter 4 Test is on Wednesday

hw → tally

Please pick up the 1/2 sheet for your warm up :)

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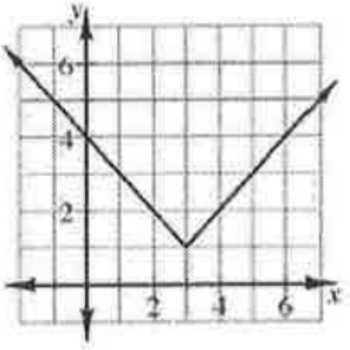
1 Examine the graph of $f(x) = |x-3|+1$ at right. Use the graph to find the values listed below.



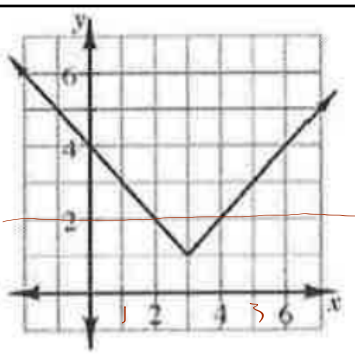
a. $f(3)$ =

b. $f(0)$ =

c. $f(4)$ =

d. $f(-1)$ =

(2) Use the graph of $f(x)=|x-3|+1$ to solve the equations and inequalities below.



a. $|x-3|+1=1$

b. $|x-3|+1\leq 4$

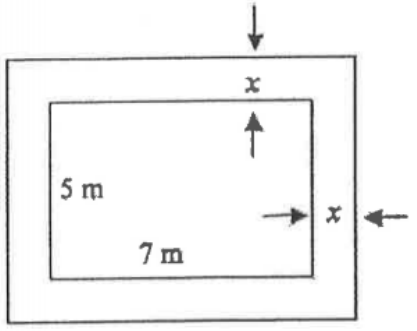
c. $|x-3|+1=3$

d. $|x-3|+1>2$

homework check

November 16, 2018

1. A rectangular pond 5 meters by 7 meters is going to be built. The builders want the pond to be surrounded by a walkway x meters wide.



The area of the concrete walkway (not including the pond) is to be 115 m^2. Calculate the value of the width of the concrete to make this happen. show your process.

2. Abraham brags, "*My cell phone plan is the best! I pay just $25 per month, and then $.10 per minute.*" Abbott quickly counters, "*Well my cell phone plan is even better! I only pay $20 per month and then $.12 per minute.*" What do you think: who has the better cell phone plan? Explain completely.

52

check $x=-1$

$2x^2+5x-3 \leq x^2+4x+3$

$2(-1)^2+5(-1)-3 \leq (-1)^2+4(-1)+3$

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

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

The AIM

for the next few days...

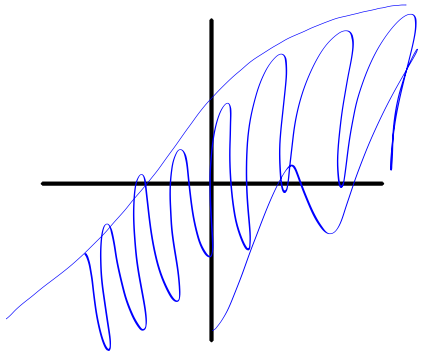
1. Solve single variable inequalities
2. Graph two variable inequalities
3. Solve systems of two variable inequalities

1. Solve single variable inequalities

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

2. Graph two variable inequalities

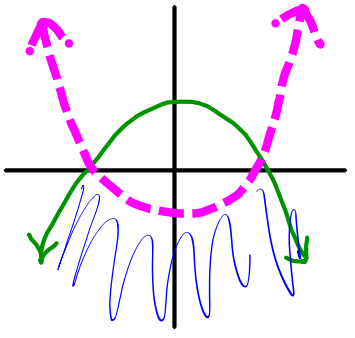
$x-2y > x+1$



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

1 Use the **boundary method** to solve the one variable inequality $2x-1 \geq 7$ by doing the following:

a) Change the inequality into an<u>equation</u> to find the boundary point.

$2x-1=7$

$2x=8$

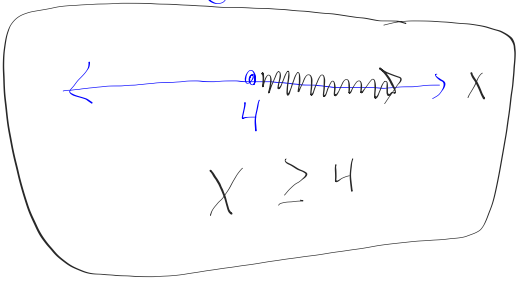
$x=4$

↑ boundary point

TEST $x=2$

$2(2)-1 \geq 7$

$3 \geq 7$ lie



$x \geq 4$

b) You should have found 4 to be the boundary point. Now choose a test point. (a number bigger or smaller than 4). Test your point in the original inequality. Then write the final solution of your inequalityand represent it on the number line above.

c) Now solve the original inequality **$2x-1 \geq 7$** algebraically to verify above.

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 $x^2 - 2x < 0$ by:**

a) Change the inequality into an<u>equation</u> to find the boundary point(s).

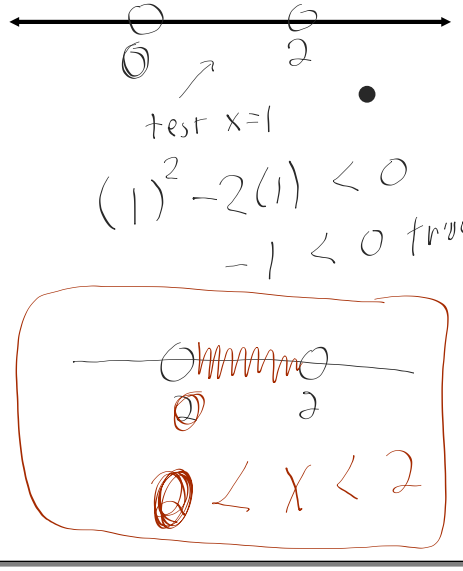
$x^2 - 2x = 0$

$x(x-2) = 0$

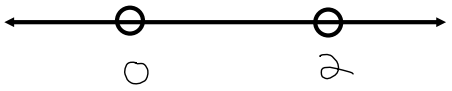
$x = 0 \quad x-2=0$

$x = 0 \quad x = 2$

boundary pts



b) Choose a test point between your two test points. (between 0 and 2)
Use your results to write the solution and shade the number line accordingly.



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

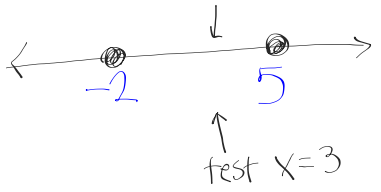
$x^2-3x-10=0$

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

$x=5 \quad x=-2$

bound. points

test

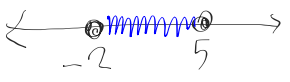


$(3)^2-3(3)-10 \leq 0$

$9-9-10$

$-10 \leq 0$

true



$-2 \leq x \leq 5$

notes Example 1

Solve

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

find boundary points

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

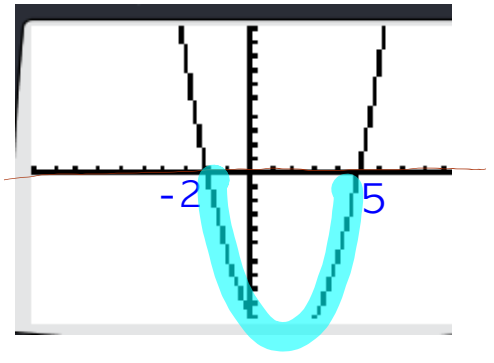
$(x+2)(x-5)=0$

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

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

Graphing Check

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



$-2 \leq x \leq 5$

EXAMPLE 2

consider the inequality $4|x+1|-2>6$

- Find boundary point(s) by changing it to an equation
- Then use a test point to help determine the solutions

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

find boundary points

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

$4|x+1|=8$

divide

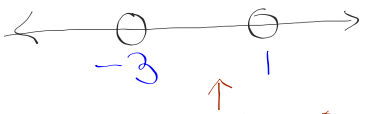
$|x+1|=2$

$x+1=2 \quad x+1=-2$

$x=1 \quad x=-3$

bound points

test



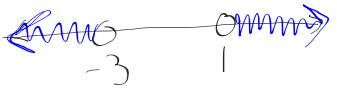
$4|0+1|-2>6$

$4|1|-2>6$

$4-2>6$

$2>6$

false



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

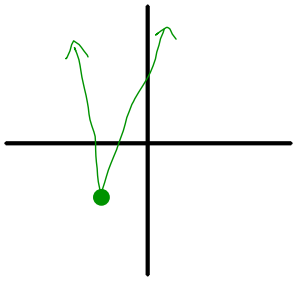
test

Now Graphically (GDC) to check

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

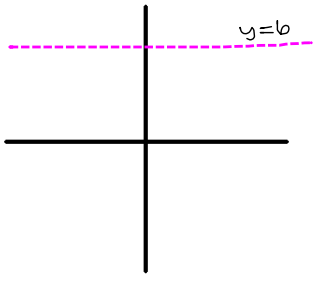
When are the y-values of

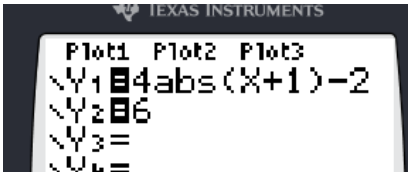
$4|x+1|-2$

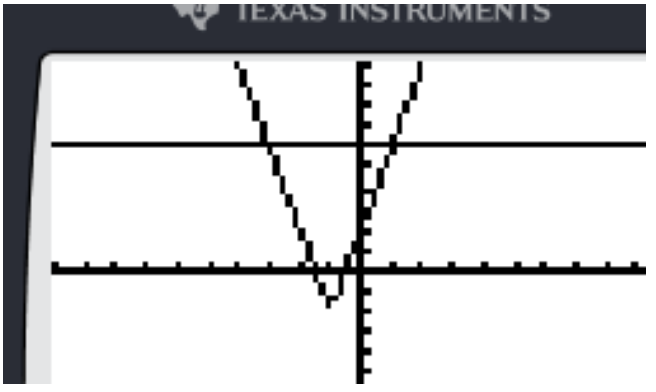


higher than the y-values of

6







Now solve the whole inequality algebraically

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

Example 3

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

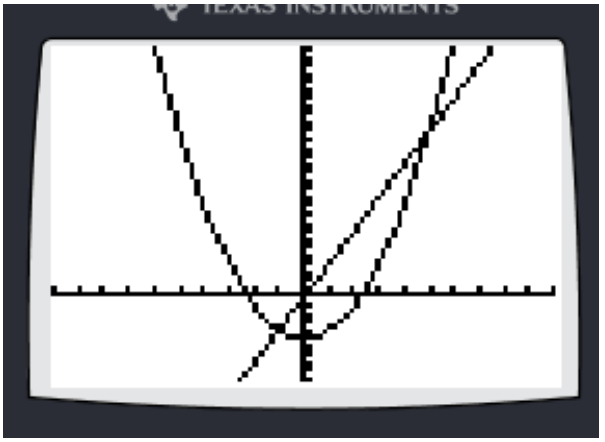
Boundary point(s)

Test

Solution

Now graphically

$x^2-5>4x$



assignment 4

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

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