Pick Up the
Warm Up

HW
Tally

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① Write the inequality that represents each graph
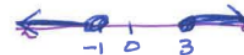
$x < 5$

$x \geq -2$

$-3 < x < 5$

$x \leq -1$ or $x \geq 3$

Single Variable
Inequality

answer can be
displayed on a
number line

Method 1   Method 2

Solve directly   A) find boundary points
(if possible)   B) TEST a point or two

Solve the inequality using either method or solve using both methods
if you want the practice).

Boundary Point Method

$$\frac{1}{2x} \geq \frac{1}{2} - \frac{2}{5x}$$

Direct (if possible)

$$\frac{1}{2x} \geq \frac{1}{2} - \frac{2}{5x}$$

Boundary Point Method

$$\frac{1}{2x} \geq \frac{1}{2} - \frac{2}{5x}$$

$$\frac{5}{2x}(10x) = \frac{5}{2}(10x) - \frac{2}{5x}(10x)$$
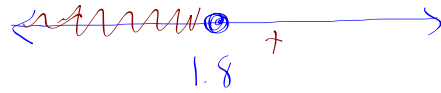
$$5 = 5x - 4$$

$$9 = 5x$$

$$x = \frac{9}{5}$$

$$= 1.8$$

Boundary Point Method

$$x \leq 1.8$$

test $x = 2$

$$\frac{1}{2(2)} \geq \frac{1}{2} - \frac{2}{5(2)}$$

$$\frac{1}{4} \geq \frac{1(5)}{2(5)} - \frac{1(2)}{5(2)}$$

$$\frac{1}{4} \geq \frac{3}{10} \quad \text{false}$$

$$.25 \qquad .3$$

Direct (if possible)

$$\frac{1}{2x}(10x) \geq \frac{1}{2}(10x) - \frac{2}{5x}(10x)$$

$$5 \geq 5x - 4$$

$$+4 \qquad\qquad +4$$

$$9 \geq 5x$$

$$\overline{5} \qquad \overline{5}$$

$$1.8 \geq x$$

$$\boxed{x \leq 1.8}$$

direct

③ $6|2x+5| \geqslant 6x+24$

choose your favorite method $x < -3$ or $x > -1$

$6|2x+5| = 6x+24$

$|2x+5| = x+4$

$2x+5 = x+4$ $2x+5 = -(x+4)$

$x+5 = 4$ $2x+5 = -x-4$

$x = -1$ $3x+5 = -4$

                $3x = -9$

                 $x = -3$

test $x = 0$

$6|2(0)+5| > 6(0)+24$

$6(5)$

$30 > 24$

true

—————————————

$6|2x+5| \geqslant 6x+24$ Boundary Point
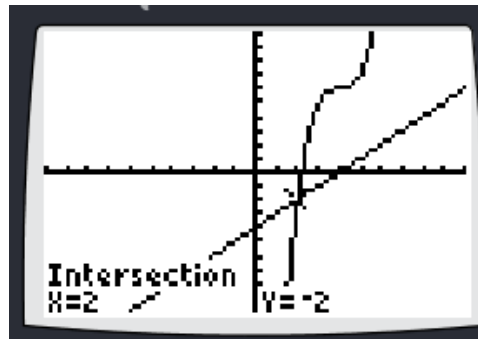
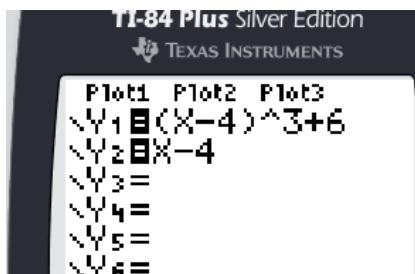directly $6\,|2x+5| \gg 6x+24$

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④ Solve $(x-4)^3 + 6 \leq x - 4$

is so complex we won't be able to use either method. So we'll have to be happy with an approximate answer.

Strategy: Break the L and R side into a system and analyze the graph.

$$(x-4)^3 + 6 \leq x - 4$$

1. Graph to find the intersections of the Left and Right Functions

2. Find the boudary point(s), mark on a number line.

3. Test a point. Decide which area to shade.

TI-84 Plus Silver Edition
TEXAS INSTRUMENTS

```
Plot1  Plot2  Plot3
\Y1 ⊟(X-4)^3+6
\Y2 ⊟X-4
\Y3=
\Y4=
\Y5=
\Y6=
```

Intersection
X=2   Y=-2

$$x \leq 2$$

Reminders

It's hard to know if you would be a good match for a certain career.

Churchill Women In Science & Engineering

WISE

2019

Hands-on Workshops taught by professionals in:
Science • Technology
Engineering • Math

Save the Date for
WISE Symposium 2019
Thursday
February 28th ~~crossed out~~
3:30-7:30 PM
Churchill H.S.
Auditorium

FREE!

Open to all Lane County
High School students!
Ask your friends to register too!

Online Registration opens
Monday,
Jan. 14th at
www.4j.chs.lane.edu

FOOD!

PRIZES!

rescheduled for May 30th

Period 2

11	12	13	14	15
Sections 4.2.2	4.2.3	Ch.4 Review	Ch.4 Test	Review Day 2
18 Review Day 2	**19** Part 1 Final	**20** Part 2 Final	**21** 30 min -Lots of BB -See your grade	**22** No school for students

Last day of Trimester 2

Periods 3 and 5

11	12	13	14	15
Sections 4.2.2	4.2.3	Ch. 4 Review	Ch. 4 Test	Review Day 2
18	19	20	21	22
Review Day 2	Part 1 Final	30 minute	Part 2 Final	No school for students

Last day of Trimester 2

Ch 4 Test Information Sheet

Check the HW

completing the square
to solve the equation

#70

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(70) $x^2 + 12x \quad +15 = 75$
$\qquad\qquad\qquad -15 \quad -15$

$x^2 + 12x + 36 \qquad = 60 + 36$

Solve by Completing the square

$(x+6)^2 = 96$

$x + 6 = \pm\sqrt{96}$

$x =$

$\left(\dfrac{12}{2}\right)^2$

$$2x + y = 12$$
$$x \cdot y = 16$$

10 x

70°

23°

A triangle with top vertex labeled x, left angle 10, right angle 11, and bottom side 3.
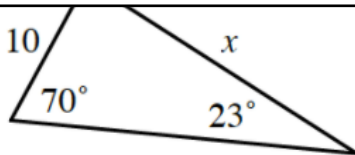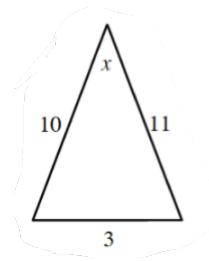
QUESTIONS
ON HW

67

(a) $5 - (y - 3) = 3x$ (b) $4(x + y) = -2$

$\boxed{67}$ (a) $5 - (y-3) = 3x$

-5 -5

$-(y-3) = 3x - 5$

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

$-y = 3x - 8$

multiply all terms by (-1)

$$\boxed{y = -3x + 8}$$

(b) $4(x+y) = -2$

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

G8 A

$(y-3)^2 = 2y-10$

$(y-3)(y-3) = 2y-10$

$y^2 - 3y - 3y + 9 = 2y - 10$

$y^2 - 6y + 9 = 2y - 10$

$y^2 - 8y + 19 = 0$

SO NOW tvx the Quadratic Formula

$a = 1 \quad b = -8 \quad c = 19$

$a = 1 \quad b = -8 \quad c = 19$

$$X = \frac{-(\quad) \pm \sqrt{(\quad)^2 - 4(\quad)(\quad)}}{2(\quad)}$$

69 d

$$\frac{2m^2 + 7m - 15}{m^2 - 16} \cdot \frac{m^2 - 6m + 8}{2m^2 - 7m + 6}$$

$$\frac{(m+5)(2m-3)}{(m+4)(m-4)} \cdot \frac{(m-2)(m-4)}{(m-2)(2m-3)}$$

65a $3x + 2 \geq x - 6$ $x \geq -4$

Bound. Pts

$3x + 2 = x - 6$

$2x + 2 = -6$

$2x = -8$

$x = -4$

test $x = 0$

$3(0) + 2 \geq (0) - 6$

$-4 \geq -6$

true

65b $\qquad 2x^2 - 5x < 12$

$2x^2 - 5x = 12$

$2x^2 - 5x - 12 = 0$

$(2x+3)(x-4) = 0$

$\Downarrow$

$2x + 3 = 0$

$x = -\frac{3}{2} \qquad x = 4$

$2(0)^2 - 5(0) < 12$

$0 < 12$

true

$\longleftarrow \longrightarrow$

66a $\quad |2x+3| < 5$

$2x + 3 < 5 \qquad 2x + 3 > -5$

find boundary points
by solving
$|2x+3| = 5$

$2x + 3 = 5 \qquad 2x + 3 = -5$

$x = 1 \qquad\qquad x = -4$

$\longleftarrow \overset{-4}{\circ}\overset{1}{\circ} \longrightarrow$
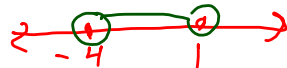
TEST $x = -2$

$|2(-2)+3| < 5$

$|-4+3| < 5$

$|-1| < 5$

$1 < 5$ true

B.B.

Aim: Solve/graph

Two Variable
Inequalities

and systems

Is   x = -4   solution to....

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

whaaaat ?

true

In that case is (-3, 0)   a solution ?
to....

$$y \geq 2x^2 + 5x - 3$$
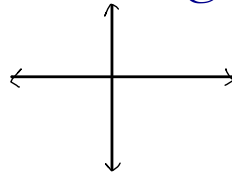
$$0 \geq 2(-3)^2 + 5(-3) - 3$$

$$0 \geq 18 - 15 - 3$$

$$0 \geq 0$$

true

but there a few more

an infinite number to
be exact

we'll show them graphically
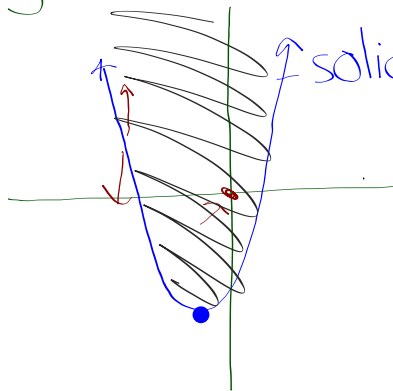
To solve a 2-variable inequality:

1. Change to an equation.
2. Solve for y (if possible)
3. Graph the boundary function.
4. Then test a point, above or below,
5. Then shade the appropriate side.

Plan: we'll do a few
schematically

Then on grid paper

(A)

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

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

↑ solid because ≥

TEST (0,0)

$0 \geq 2(0)^2 + 5(0) - 3$

$0 \geq -3$
   true

(B) $y < |x - 3| + 1$

$y = |x - 3| + 1$

TEST (3, 0)

$0 < |3 - 3| + 1$

$0 < 1$

true

(C) Solve
A system

$y \geq 2x + 1$

$y \leq \frac{1}{2}x + 3$

TEST
$y > 2x + 1$
TEST (0, 0)
$0 > 2(0) + 1$
$0 > 1$
false

TEST
$y \leq \frac{1}{2}x + 3$
TEST (2, 1)
$1 \leq \frac{1}{2}(2) + 3$
$1 \leq 4$
true