

Trig 3.3

Graph polynomial, absolute value, and radical inequalities

Solve absolute value inequalities

Determine solutions to inequalities

Quiz 3.1-3.2 Thurs.

$\leq \geq$ $\longleftrightarrow$
closed

families of functions/ parent graphs (3.2)

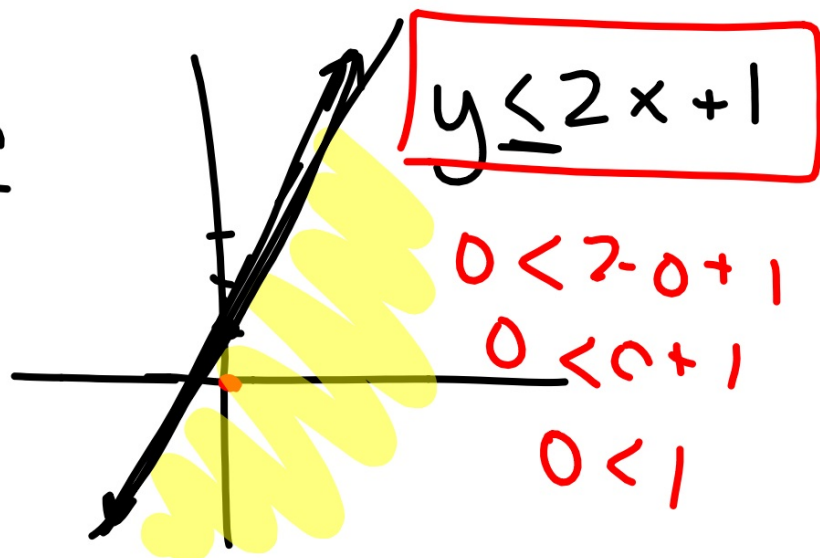
continuous functions only

inequality $< >$
open
- - -

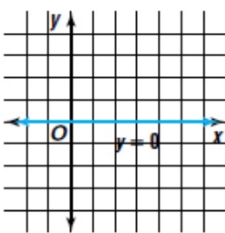
boundary

test point

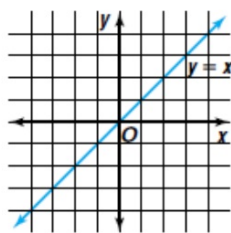
Shade T



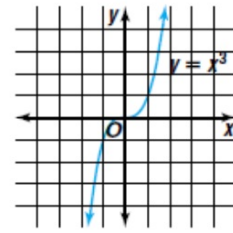
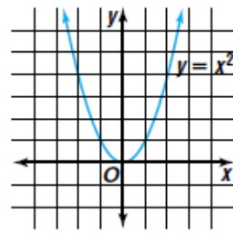
constant function



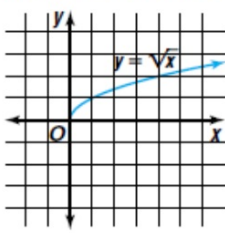
identity function



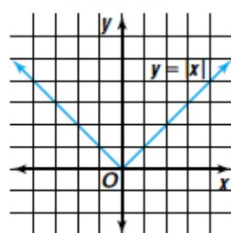
polynomial functions



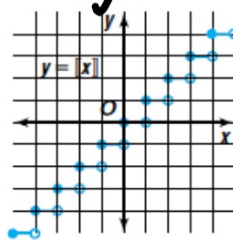
square root function



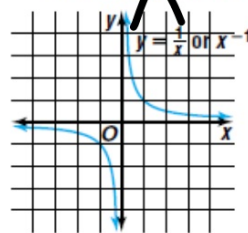
absolute value function



~~greatest integer function~~



~~rational function~~



< > for continuous functions only

1 Determine whether $(3, -4)$, $(4, 7)$, $(1, 1)$, and $(-1, 6)$ are solutions for the inequality $y \leq (x - 2)^2 - 3$.

$$1 \leq (1-2)^2 - 3$$

$$1 \leq (-1)^2 - 3$$

algebraically or graphically?

$$\frac{y}{x}$$

$$(3, -4)$$

$$(-1, 6)$$

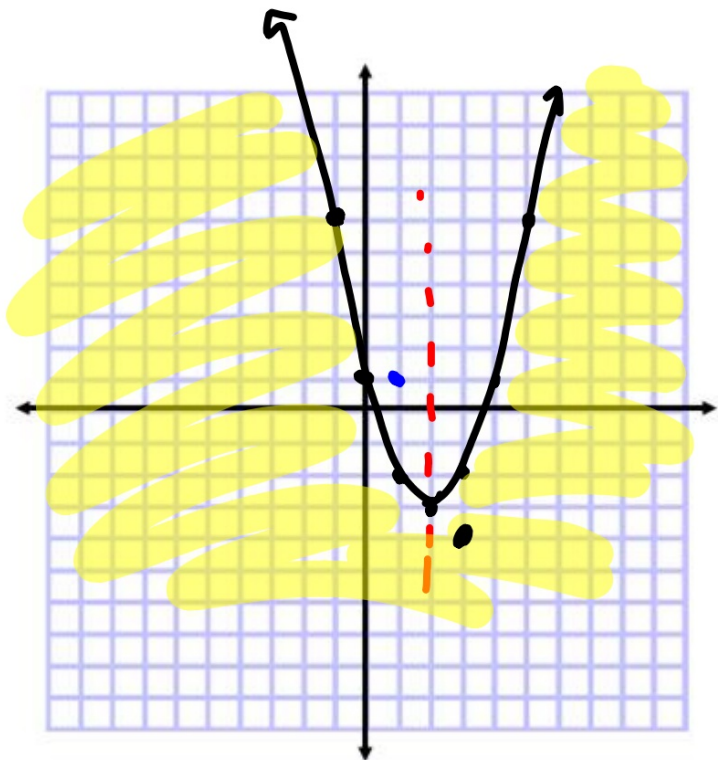
$$1 \leq 1 - 3$$

$$1 \leq -2$$

$$\frac{no}{(4, 7)}$$

$$(1, 1)$$

Solve by graphing
Solve using algebra



algebraically/graphically ??

Determine whether the ordered pair is a solution for the given inequality. Write *yes* or *no*.

5. $y \geq -5x^4 + 7x^3 + 8$, $(-1, -3)$

yes

$$-3 \geq -5(-1)^4 + 7(-1)^3 + 8$$

$$-3 \geq -5(1) + 7(-1) + 8$$

$$-3 \geq -5 + -7 + 8$$

$$-3 \geq -4$$

6. $y < |3x - 4| - 1$, $(0, 3)$ no

$$3 < |3 \cdot 0 - 4| - 1$$

$$3 < |0 - 4| - 1$$

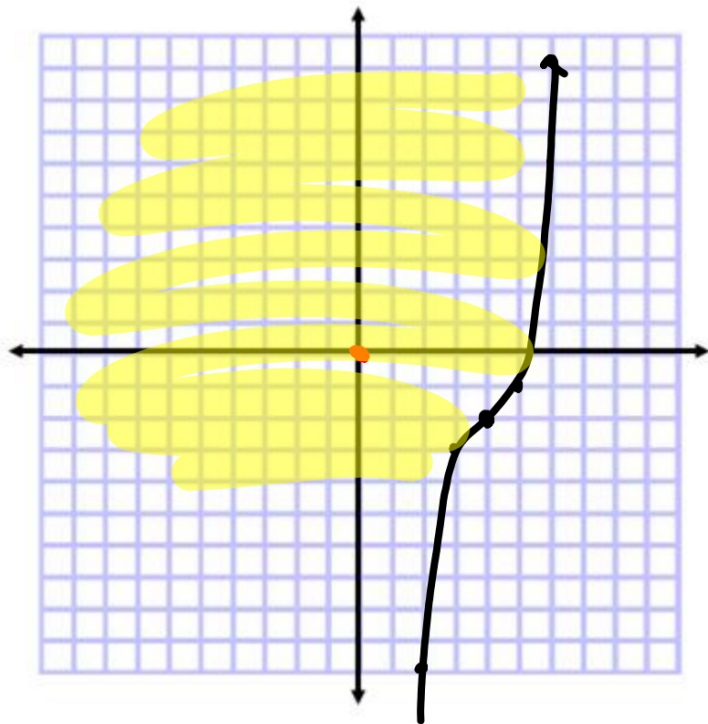
$$3 < 4 - 1$$

$$3 < 3$$

2 Graph $y \geq (x - 4)^3 - 2$.

$0 \geq (0 - 4)^3 - 2$
 $0 \geq -64 - 2$
 $0 \geq -66$

parent graph
 transformation
 test point
 boundary open or closed?



parent graph
transformation

test point

boundary open or closed?

$$y > \sqrt{x-3} + 1$$

neg $\frac{1}{2}$

$$x \geq 3$$

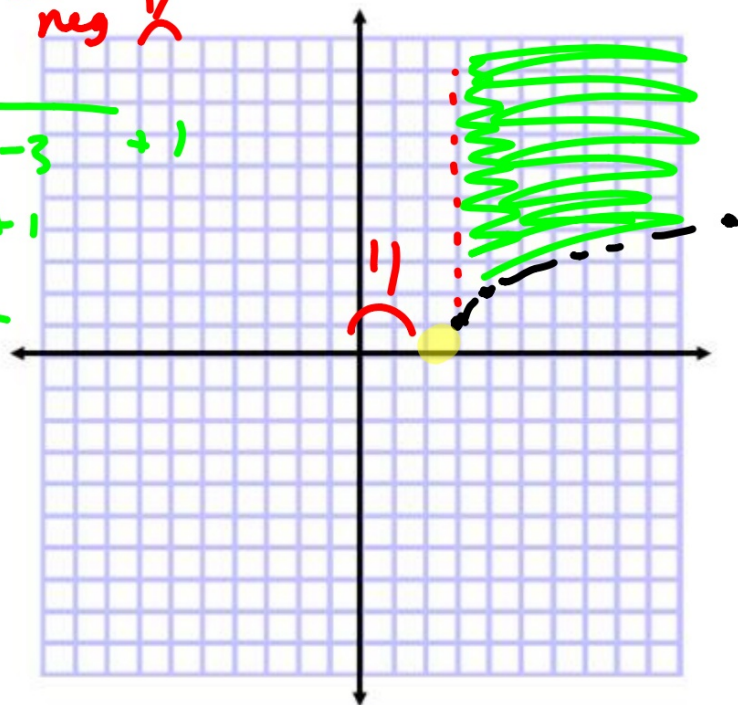
$$0 > \sqrt{4-3} + 1$$

$$0 > 1 + 1$$

$$0 > 2$$

3 Graph ~~$y \geq 3 - |x + 2|$~~ .

No man's land



How is this problem different?

Where is one graph above/below the other?

4 Solve $|x - 2| - 5 < 4$.

Desmos

$y = |x - 2| - 5$

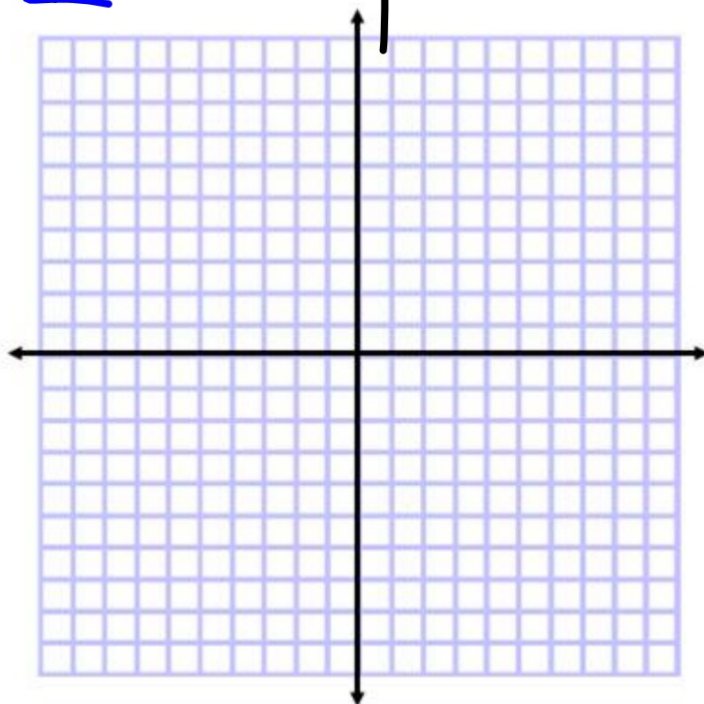
$y = 4$

Solve by graphing

What x-values are involved? (estir

graphically

algebraically



Solve using a graph, solve using algebra
Methods are different, but answers will be the same.

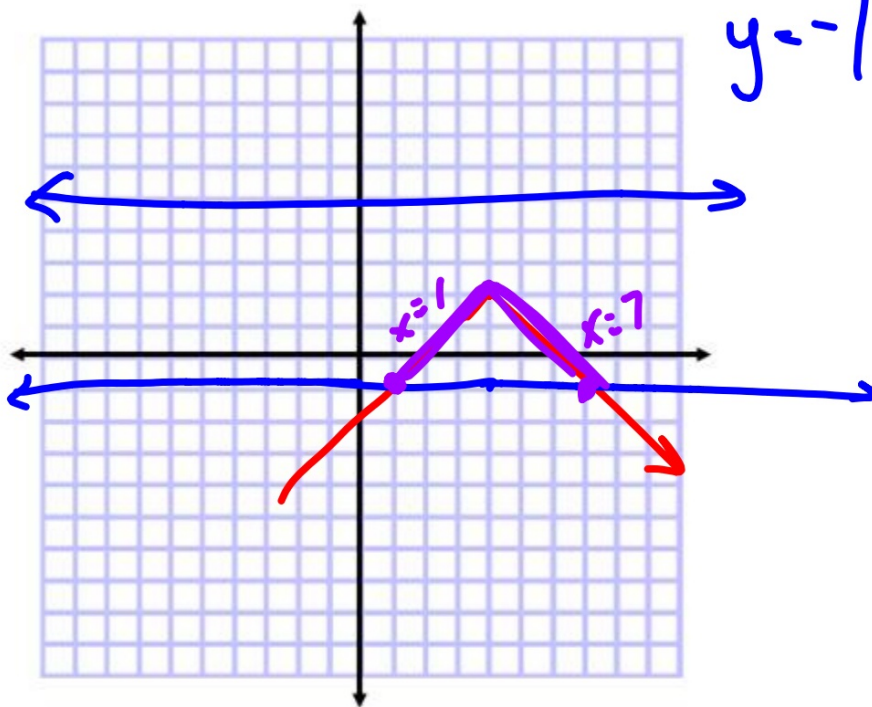
4 Solve $|x - 2| - 5 < 4$.

Graph each inequality.

7. $y \leq (x + 1)^3$

8. $y \leq 2(x - 3)^2$

9. $y > -|x - 4| + 2$



$y = -1$

$y = -|x - 4| + 2$

$1 < x < 7$

What is the difference between...

