

1. \*complex numbers: can have imaginary solution.

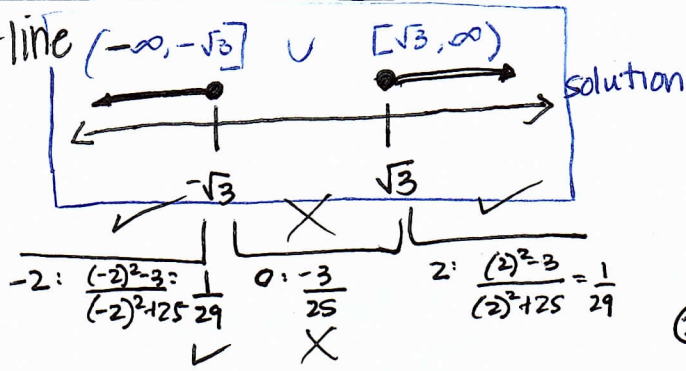
$$\sqrt{(x-2)^2} = \sqrt{-5}$$

$$x-2 = \pm i\sqrt{5}$$

$$x = 2 \pm i\sqrt{5} \Rightarrow a) x = 2 + \sqrt{5}i, 2 - \sqrt{5}i$$

2. \* inequality = draw # line

$$\frac{x^2-3}{x^2+25} \geq 0$$



① Find critical #'s

$$\begin{aligned} x^2-3 &= 0 & x^2+25 &= 0 \\ x^2 &= 3 & x^2 &= -25 \\ x &= \pm\sqrt{3} & x &= \pm 5i \\ & & & \uparrow \\ & & & \text{not real} \end{aligned}$$

② fill in what makes num. 0  
 ③ Test each section. plug values into original problems.

3. \* Domain: #'s can be plugged in for x.

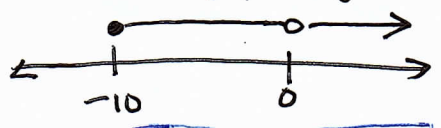
$$f(x) = \frac{\sqrt{x+10}}{x}$$

← can only take √ of #'s bigger than or equal to 0.

cannot divide by 0. →  $x \neq 0$

$x+10 \geq 0$   
 $x \geq -10$

put in interval notation by plotting on #line

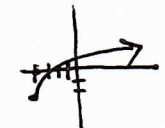


Domain:  $[-10, 0) \cup (0, \infty)$

5. D of function are R of inverse.

$$f(x) = \sqrt{x+4} - 2$$

Graph on calculator.  
 or use transformations



D:  $[-4, \infty)$   
 R:  $[-2, \infty)$

$$f^{-1}(x)$$

D:  $[-2, \infty)$   
 R:  $[-4, \infty)$

4.  $y = \sqrt{x}$  graph. Then graph each option and see which move right 3 and flipped upside down.

OR

$$y = -\sqrt{x-3}$$

reflects y-values (which is across x-axis)  
 moves to  $x=3$  because  $3-3=0$   
 horizontal movement

6.  $f(x) = \sqrt{x}$

$$g(x) = x^2 - 1 \quad f \circ g = \sqrt{x^2 - 1}$$

D:  $\mathbb{R}$

D:  $x^2 - 1 \geq 0$

