

# Solving Radical Inequalities:

Remember:

- Can not have a negative inside of a square root.
- Set restrictions on what  $x$  can be so we avoid negatives inside the root.

ex)

$$\sqrt{x-3}$$

set the inside  $\geq 0$

$$x-3 \geq 0$$

$$+3 \quad +3$$

$$x \geq 3$$

restriction:  $x \geq 3$

allowed use 3 or bigger

$$2 + \sqrt{4x - 4} \leq 6$$

-2

$$\sqrt{4x - 4} \leq 4$$

$$4x - 4 \leq 16$$

$$+4 \quad +4$$

$$4x \leq 20$$

$$x \leq 5$$

answer



$$x \leq 5 \text{ and } x \geq 1$$

$$1 \leq x \leq 5$$

Steps:

① Find the restriction

restriction: set inside  $\geq 0$

$$4x - 4 \geq 0$$

$$+4 \quad +4$$

$$\frac{4x}{4} \geq \frac{4}{4}$$

$$x \geq 1$$

② Solve the inequality  
reminder: mult/div. by a  
neg. number you flip  
the inequality

③ Graph the restriction &  
solution  
- overlap is the answer

$$\sqrt{2x+4} - 5 > 1$$
$$+5 \quad +5$$

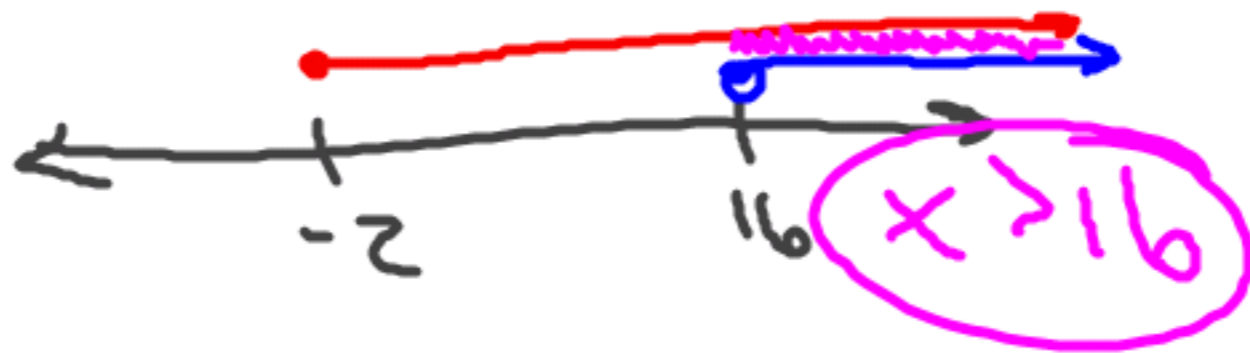
$$\sqrt{2x+4} > 6$$

$$2x+4 > 36$$
$$-4 \quad -4$$

$$2x > 32$$
$$\frac{2x}{2} > \frac{32}{2}$$
$$x > 16$$

restriction:

$$2x+4 \geq 0$$
$$-4 \quad -4$$
$$\frac{2x}{2} \geq \frac{-4}{2}$$
$$x \geq -2$$



$$\sqrt{b-5} - \sqrt{b+7} \leq 4$$

restriction 1:  
 $b-5 \geq 0$   
 $b \geq 5$

restriction 2:  
 $b+7 \geq 0$   
 $b \geq -7$

$$\left(\sqrt{b-5}\right) \leq \left(4 + \sqrt{b+7}\right)$$

$$b-5 \leq (4 + \sqrt{b+7})(4 + \sqrt{b+7}) \text{ DISTRIBUTE}$$

$$b-5 \leq 16 + 4\sqrt{b+7} + 4\sqrt{b+7} + (b+7)$$

$$-5 \leq 23 + 8\sqrt{b+7} + \frac{1}{b}$$

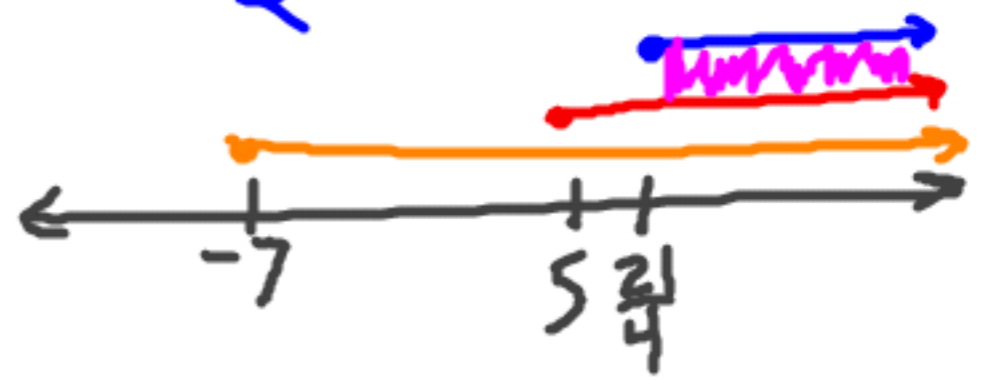
$$-28 \leq 8\sqrt{b+7}$$

$$\left(\frac{-28}{8}\right)^2 \leq \sqrt{b+7}$$

$$\frac{49}{4} \leq b+7$$

$$\frac{49}{4} - 7 \leq b$$

$$\frac{21}{4} \leq b$$



5-8 Skills Practice WS

2-16E, 18-24 all

review

inequalities