

# Lesson 33 – Inequalities with Radical Functions

Math 2 Honors - Santowski

## Fast Five

- Define a 1:1 function
- Is  $f(x) = \sqrt{x}$  a 1:1 function?
- Is  $f(x) = \sqrt{x}$  the inverse FUNCTION of  $g(x) = x^2$ ?
- Is  $f(x) = x^2$  a 1:1 function?
- Explain why using the inverse function to create "an equivalent system" sometimes doesn't "work" and we get extraneous solutions
- Q? Will you get extraneous solutions when you solve cube root equations? Why? Why not?

## Radical Inequalities

- Recall that "rules" & "processes" for inequalities are sometimes different for inequalities than they are for equations
- Ex: Solve ALGEBRAICALLY

- $2\sqrt{x+4} \geq 6$
- $3\sqrt{x+2} \leq 6$
- $4\sqrt{4-2x} > 12$
- $\sqrt{x+2} < -2$

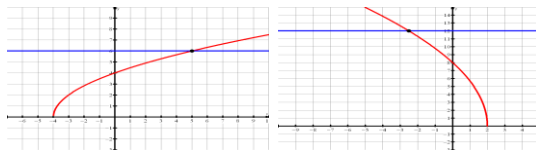
## Radical Inequalities

- Recall that "rules" & "processes" for inequalities are sometimes different for inequalities than they are for equations
- Ex: Solve GRAPHICALLY → SO WHAT'S different???

- $2\sqrt{x+4} \geq 6$
- $3\sqrt{x+2} \leq 6$
- $4\sqrt{4-2x} > 12$
- $\sqrt{x+2} < -2$

## Solutions

- $2\sqrt{x+4} \geq 6$
- $3\sqrt{x+2} \leq 6$
- $4\sqrt{4-2x} > 12$
- $\sqrt{x+2} < -2$



## Radical Inequalities

- So the key point in radical inequalities is to:
- (a) Check your solution
- (b) check your domain

## (B) Radical Inequalities - Examples

### ■ Solve & verify algebraically

(a)  $\sqrt{x-5} > x+2$

(b)  $\sqrt{4x+12} \leq \frac{1}{2}x+3$

(c)  $\sqrt{4-2x} \geq \sqrt{x+2}+1$

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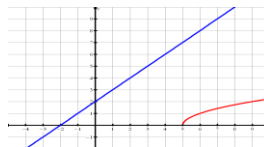
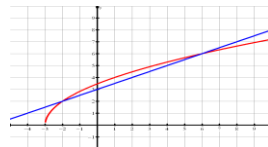
7

## (B) Radical Inequalities - Examples

(a)  $\sqrt{x-5} > x+2$

(b)  $\sqrt{4x+12} \leq \frac{1}{2}x+3$

(c)  $\sqrt{4-2x} \geq \sqrt{x+2}+1$



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8

## (B) Radical Inequalities - Examples

### ■ Solve and verify (algebraically)

$$\sqrt{2x+4} < \sqrt{x}+1$$

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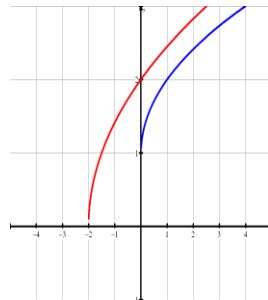
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9

## (B) Radical Inequalities - Examples

### ■ Solve and verify (algebraically)

$$\sqrt{2x+4} < \sqrt{x}+1$$



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10

## Homework

- p. 542 # 27-37 odds, 38, 45, 47, 49, 50, 52, 55, 59, 60

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11