

Beginning &  
INTERMEDIATE Algebra

Basics of Radical Expressions and Functions

Nov 10-3:44 PM

Simplify the following radicals

$\sqrt{49}$   
7

$-\sqrt{100}$   
-10

$\pm \sqrt{81}$   
9, -9  
±9

$\sqrt{-25}$   
NOT  
REAL

Nov 10-3:44 PM

Simplify the following radicals

$\sqrt[3]{-27}$   
-3

$\sqrt[3]{-125}$   
-5

$\sqrt[5]{32}$   
2

$\sqrt[3]{\frac{64}{125}}$   
 $\frac{\sqrt[3]{64}}{\sqrt[3]{125}} = \frac{4}{5}$

Nov 10-3:44 PM

RATIONAL, IRRATIONAL, NOT REAL

Rational

$\sqrt{4} = \frac{2}{1}$

$\sqrt[3]{64} = \frac{4}{1}$

$\sqrt[5]{25} = \frac{5}{1}$

Irrational

$\sqrt{7}$

$\sqrt{12}$

Not Real

$\sqrt{-432}$

Nov 10-3:44 PM

$3^2 = 9$

$\sqrt{9} = 3$

$\sqrt[3]{125} = 5$

$5^3 = 125$

$\sqrt[5]{243}$

$3^5 = 243$

May 11-12:14 PM

Radical Vocabulary

Root / Index

Radical Symbol

Radicand

Nov 10-3:44 PM

Let's work this one together

$$f(x) = \sqrt{3x + 2}$$

$$f(3) = \sqrt{3(3) + 2}$$

$$\sqrt{11}$$

$$f(-5) = \sqrt{3(-5) + 2}$$

$$\sqrt{-13} \rightsquigarrow \text{NOT REAL}$$

Nov 10-3:44 PM

Finding the DOMAIN

What is the DOMAIN?

What is the smallest number we can take the square root of and still get a REAL NUMBER answer?

$$f(x) = \sqrt{\text{~~~~~}}$$

$$\text{~~~~~} \geq 0$$

Nov 10-3:44 PM

Finding the DOMAIN

Find the domain of the given function

$$f(x) = \sqrt{3x + 2}$$

Set the **RADICAND** greater than or equal to **ZERO**.  
(WHY???)

**SOLVE** the inequality. This is your **DOMAIN**

$$3x + 2 \geq 0$$

$$\frac{-2}{-2} \quad \frac{-2}{-2}$$

$$\frac{3x}{3} \geq \frac{-2}{3}$$

$$x \geq -\frac{2}{3}$$

Nov 10-3:44 PM

You Try...

Find the domain of the following function

$$f(x) = \sqrt{-2x + 6}$$

$$-2x + 6 \geq 0$$

$$\frac{-6}{-2} \quad \frac{-6}{-2}$$

$$-2x \geq \frac{-6}{-2}$$

$$x \leq 3$$

SBN:  $\{x | x \leq 3\}$   
I.N.:  $(-\infty, 3]$

Nov 10-3:44 PM