

Pre Calc 11 - Chp 2 Review/Ref Sheet

Note Title

2015-09-24

Absolute Value - is a function:

Can also be defined as: $|x| = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$

Domain: $x \in \mathbb{R}$

Used for: magnitude, speed, distance

The Principal Square Root is always positive. The confusion occurs when we have:

$$\begin{aligned} x^2 &= 49 \\ |x| &= \sqrt{49} \\ x &= \pm 7 \end{aligned}$$

$$\begin{aligned} \text{but } x &= \sqrt{49} \\ x &= 7 \quad \text{only } +, \text{ not } \pm \end{aligned}$$

Simplifying Radical Expressions. - recall that radicals are another way of writing exponents.

$$\sqrt[m]{a} \cdot \sqrt[n]{a} = a^{\frac{1}{m} + \frac{1}{n}}$$

$$\frac{\sqrt[m]{a}}{\sqrt[n]{a}} = a^{\frac{1}{m} - \frac{1}{n}}$$

$$\left(\sqrt[m]{a}\right)^n = a^{\frac{n}{m}}$$

$$\sqrt[m]{\frac{a}{b}} = \frac{a^{\frac{1}{m}}}{b^{\frac{1}{m}}}$$

$$\sqrt[m]{ab} = a^{\frac{1}{m}} b^{\frac{1}{m}}$$

$$\frac{1}{\sqrt[m]{a}} = a^{-\frac{1}{m}}$$

$$a \sqrt[m]{b} = \sqrt[m]{a^m b}$$

Mixed radical: $a \sqrt[m]{b}$ constant out front

Entire radical: $\sqrt[m]{a}$ constant is 1 out front.

Determining Domain:

radicand ≥ 0 for even indices
 $x \in \mathbb{R}$ for odd indices

Adding and Subtracting Radical Expressions - we simply do what we always do, group like-terms.

It is best to simplify radicals first.
Reduce fractions that are exponents.

Multiplying and Dividing Radical Expressions - we need to know that $\sqrt[m]{a} \cdot \sqrt[m]{b} = \sqrt[m]{ab}$.

Multiply conjugates (for a difference of squares)
only way to remove radicals
If there are variables, just carry on as usual.

When finalizing answers, you MUST:
Rationalizing the denominator - means no radicals in the denominator.

- monomial denominator - multiply by the radical
- binomial denominator - multiply by the conjugate.

Solving Radical Equations - solve as you do with regular algebra operations; isolate the radical & square both sides. The main difference is that you need to check for extraneous roots.

If there are radicals on both sides, just square both sides.

Write your own examples if needed!