The number of REAL	nth	roote	of	a numbe	۵r
THE HUITIDE OF REAL	_ 11011	10018	OI	a numbe	31

Radicand is	Index is even	Index is odd
Positive	2	1
Zero	1	1
Negative	0	1

$$\sqrt{25} = 5$$

in this situation $\sqrt{}$ indicates the Principal Root

When there are two roots the Principal Root is the positive root.

There are _____ even roots of every positive number.

- √ asks for the Negative Root

 $\pm \sqrt{}$ asks for the Pos & Neg Roots

√ asks for the Positive Root

Simplify each.

$$-\sqrt{49} = \underline{}$$

2.
$$\pm \sqrt{36} = \pm 6$$

A real number raised to an even power is ALWAYS POSITIVE.

A real number raised to an odd power can either be negative or positive.

The answer will have the same sign as the base.

Simplify.

1.
$$\sqrt{a^2}$$
 \rightarrow An even root without any sign in front means the Principal Root (Pos Root).

$$\sqrt{a^2} = \lambda = |a|$$

 $\sqrt{a^2} = |a|$ Since we don't know if the variable a is positive or not we put Absolute Value symbols around the answer to ensure the result is positive.

2.
$$\sqrt[3]{x^3} = x$$
 Answer will have the same sign as the radicand which means answer can be either positive OR negative.

DON'T use Absolute Value symbols!

The answer from an even radical must be POSITIVE. "Principal Root"

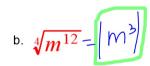
The answer from an odd radical can be anything.

Answer will have the same sign as the radicand.

Simplify each. Use absolute value symbols when needed.



r⁵ could be negative. But since it is coming out of an even root we need to make sure it comes out positive so we ensure a positive result by using Absolute Value Symbols



m³ could be negative. But since it is coming out of an even root we need to make sure it comes out positive so we ensure a positive result by using Absolute Value Symbols



There are two reasons we don't need Absolute Value symbols in this answer:

- 1. We are taking an odd root which can lead to a positive or negative answer. Therefore, we don't want to force it to be positive.
- 2. Since answer is raised to an even power w⁸ will automatically be positive

Get a small white board, rag, and marker

You can now finish Hwk #15

Sec 7-1

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Problems 1, 3, 5, 6, 22, 23, 25-27 Simplify each. Use absolute value symbols when needed.

$$2.a.\sqrt{x^4} = \chi^2$$

$$2.a.\sqrt{x^4} = \chi^2$$
 b. $\sqrt[3]{m^{12}} = m^4$

3.a.
$$\sqrt{x^6} = \left| \times^3 \right|$$

b.
$$\sqrt[3]{m^{21}} = \boxed{m}$$

4.a.
$$\sqrt{9x^8} = 3x^9$$

b.
$$\sqrt[3]{-125Q^{36}} = -5Q^{12}$$

Simplify each. Use absolute value symbols when needed.

$$5. \sqrt{36x^{22}} = \left(\bigcirc \middle| \chi^{(1)} \middle| \right)$$

6.
$$\sqrt{x^9} = \sqrt{\chi^8 \cdot \chi^1} = \chi^4 \sqrt{\chi}$$

7.
$$\sqrt{x^{15}} = \sqrt{\chi'' \cdot \chi} = \sqrt{\chi'' \cdot \chi}$$

Simplify each. Use absolute value symbols when needed.

8.
$$\sqrt{16x^{27}} = \left(4 \left| x^{13} \right| \right)$$

9.
$$\sqrt{25a^{18}b^7c^{13}} = \begin{bmatrix} 5 |a^9||b^3|c^6 & \text{bc} \\ 08 & 5 |a^9|b^3|c^6 & \text{fbc} \end{bmatrix}$$

10.
$$\sqrt[3]{x^6} = (\times^2)$$

Simplify each. Use absolute value symbols when needed.

11.
$$\sqrt[3]{x^{15}} = \sqrt{\chi^{5}}$$

12.
$$\sqrt[3]{8x^{33}} = (2 \times^{11})$$

13.
$$\sqrt[3]{x^{14}} = \sqrt[3]{\chi^{(2)} \cdot \chi^{2}} = \sqrt[\chi^{4} \rightarrow \chi^{2}]$$