In general:

All positive numbers have:

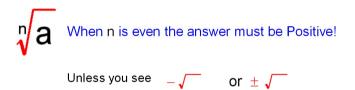
2 Real Even Roots ±

1 Odd Root +

All Negative numbers have:

0 Real Even Roots

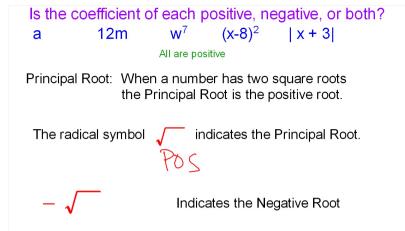
1 Odd Root -





When n is odd the answer can be Positive OR Negative.

Answer has the same sign as the radicand.



Incidates both roots.

Can you tell if each answer is positive, negative, or both?

$$\begin{array}{cccc} & & & & & & & & \\ & & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & \\ & & \\$$

6.
$$\sqrt[6]{R}$$
 4. $\pm \sqrt[8]{C}$ Both Pos and Neg

Can you tell if each answer is positive or negative?

1. a^4 POS

2. b⁷ Could be Pos or Neg

3. C³ Could be Pos or Neg

4. d^{10} POS

DEFINITELY POSITIVE:

even

 $\boldsymbol{\chi}^{\mathsf{even}}$

COULD BE POS OR NEG:



 χ odd

In general:

- any real number raised to an even power is always POS
- any real number raised to an odd power can be either POS or NEG

Has the same sign as the base

Simplify each:

1. $\sqrt{g^{12}} = (g^{12})^{\frac{1}{2}}$

$$-\sqrt[4]{w^{20}} = \sqrt{\omega^5}$$

3.
$$\sqrt[5]{x^{35}} = \chi^{\gamma}$$

4.
$$\sqrt[3]{h^{12}} = \sqrt[h]{4}$$

To ensure that the result of an even root is positive (Principal Root) you may have to place some or all of the answer in Absolute Value symbols.

- Absolute Value symbols must be used if:
 Index is EVEN and result could be negative
 (has an ODD exponent)
- No Absolute Value symbols should be used if:
- o Index is EVEN and answer is positive

(has an EVEN exponent)

o Index is ODD

Simplify each.

1.
$$\sqrt{m^{13}}$$

2.
$$\sqrt[3]{c^{20}}$$



