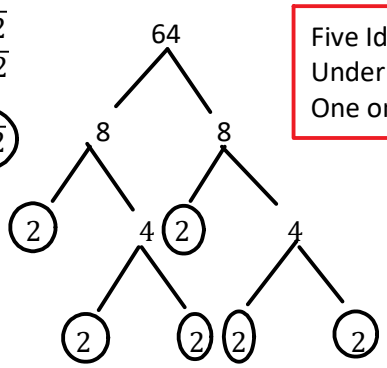
M10 - 4.2 - Mixed to Entire/Variables Radicals Notes

Simplify

$\sqrt[5]{64} = \sqrt[5]{2\times2\times2\times2\times2\times2}$
$= \sqrt[5]{2\times2\times2\times2\times2\times2}$
$= 2\sqrt[5]{2}$



Five Identical Numbers Under a Fifth Root: One on Outside.

$5 = \sqrt{5^2}$
$5x = \sqrt{5^2x^2}$
$5 = \sqrt[3]{5^3}$

Check Answer
$2.30 = 2.30$ ✓

Check on Calculator OR

2nd	5	$\sqrt[x]{\square}$	$x^{\frac{1}{y}}$
Ti84	Math	5	$\sqrt[x]{\square}$

$\sqrt[2]{x^2} = \sqrt[2]{x\times x}$
$= x$

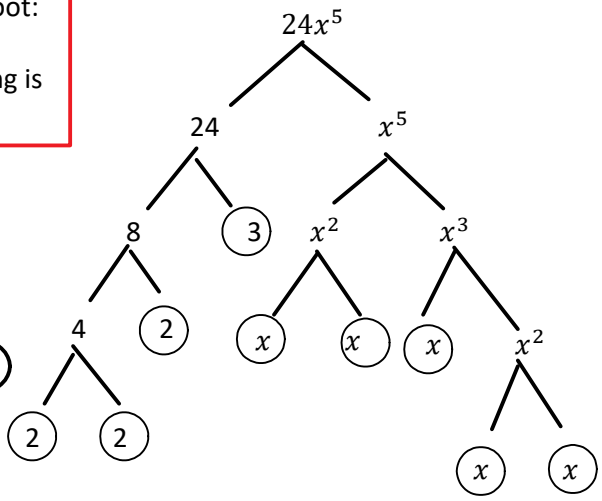
x^2

x x

Two Identical Variables Under a Square Root: One Comes Out. Nothing is left.

Check Answer
$\sqrt[2]{5^2} = 5$
Arbitrary Number ✓

$\sqrt[3]{24x^5} = \sqrt[3]{2\times2\times2\times3\times x\times x\times x\times x\times x}$
$= 2x\sqrt[3]{3x^2}$



Expand

$5\sqrt[2]{2} = \sqrt[2]{5\times5\times2}$
$= \sqrt[2]{25\times2}$
$= \sqrt[2]{50}$

One number Outside of a Square Root: Two Inside.

Check Answer
$7.08 = 7.07$ ✓

$5\sqrt[3]{2} = \sqrt[3]{5\times5\times5\times2}$
$= \sqrt[3]{125\times2}$
$= \sqrt[3]{250}$

One Number Outside of a Cube root: Three Inside.

Check Answer
$8.55 = 8.55$ ✓

$-7\sqrt[2]{3} = -\sqrt[2]{7\times7\times3}$
$= -\sqrt[2]{49\times3}$
$= -\sqrt[2]{147}$

A Negative may Not go Inside an Even Root

Check Answer
$-12.12 = -12.12$ ✓

$-4\sqrt[5]{5} = \sqrt[5]{-4\times4\times4\times4\times4\times5}$
$= \sqrt[5]{-4^5\times5}$
$= \sqrt[5]{-5120}$

One Number Outside of a Fifth Root: Five Inside.

Check Answer
$-5.52 = -5.52$ ✓

A Negative may go Inside an Odd Root