C11 - 5.1 - Adding and Subtracting Radicals Notes

Square Roots

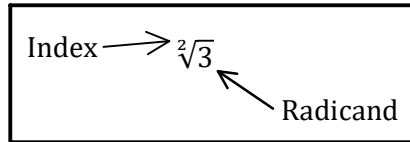$\sqrt[2]{7} + \sqrt[2]{7} = \boxed{2\sqrt[2]{7}}$ Like Radicals: Add or subtract coefficients. $\boxed{x + x = 2x}$

$\quad 5.29 = 5.29$ ✓   Like Radicals: Same radicand, same index

$1\sqrt[2]{3} + 1\sqrt[2]{3} = \boxed{2\sqrt[2]{3}}$

$\quad 3.46 = 3.46$ ✓   Index $\longrightarrow \sqrt[2]{3} \longleftarrow$ Radicand

$2\sqrt[2]{3} + 5\sqrt[2]{3} = \boxed{7\sqrt[2]{3}}$

$\quad 12.12 = 12.12$ ✓

Calcuator

$\boxed{\sqrt[2]{3} + \sqrt[2]{2} = \sqrt[2]{3} + \sqrt[2]{2}}$ Cannot add/subtract unlike radicals. $\boxed{\sqrt[2]{3} + \sqrt[2]{2} = 1.71 + 1.41 = 3.15}$

Can only add/subtract like radicals.

$4\sqrt[2]{2} - 7\sqrt[2]{2} = -3\sqrt[2]{2}$

$\quad -4.24 = -4.24$ ✓

Simplify Roots
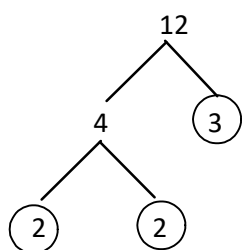
$\sqrt[2]{12} + \sqrt[2]{27} + \sqrt[2]{18} + 5$ $\sqrt[2]{12} = \sqrt[2]{2 \times 2 \times 3}$ $\sqrt[2]{27} = \sqrt[3]{3 \times 3 \times 3}$ $\sqrt[2]{18} = \sqrt[2]{3 \times 3 \times 2}$
$2\sqrt[2]{3} + 3\sqrt[2]{3} + 3\sqrt[2]{2} + 5$

$\boxed{5\sqrt[2]{3} + 3\sqrt[2]{2} + 5}$ $= \boxed{2\sqrt[2]{3}}$ $= \boxed{3\sqrt[3]{3}}$ $= \boxed{3\sqrt[2]{2}}$

$\quad 17.9 = 17.9$ ✓   12   27   18
                              4   3   3   9   9   2
                           2   2   3   3   3   3
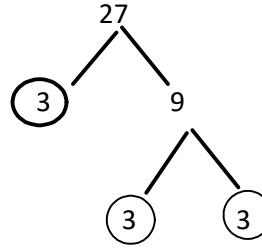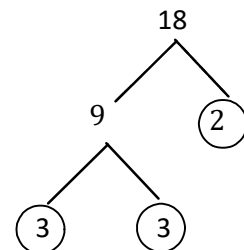
Cube Roots

$\sqrt[3]{7} + \sqrt[3]{7} = \boxed{2\sqrt[3]{7}}$

$\quad 3.83 = 3.83$ ✓

$\sqrt[3]{5} + \sqrt[3]{5} = \boxed{2\sqrt[3]{5}}$

$\quad 3.42 = 3.42$ ✓

$-2\sqrt[3]{5} - 6\sqrt[3]{5} = \boxed{-8\sqrt[3]{5}}$

$\quad -13.68 = -13.68$ ✓

$\boxed{\sqrt[3]{3} + 1 = \sqrt[3]{3} + 1}$ Can only add or subtract like radicals.