C11 - 5.2 - Multiplying and Dividing Radicals Notes

$\sqrt[2]{3} \times \sqrt[2]{3} = \sqrt[2]{3 \times 3}$
$\quad\quad = \sqrt[2]{9}$

$\boxed{= 3}$ (circled)

$7 \times \sqrt{5} = \boxed{7\sqrt{5}}$

$\sqrt{5} \times 7 = \boxed{7\sqrt{5}}$

$13.23 = 13.23$ ✓

$\sqrt[2]{5} \times \sqrt[2]{3} = \sqrt[2]{5 \times 3}$
$\quad\quad\boxed{= \sqrt[2]{15}}$

$3.87 = 3.87$ ✓

$3\sqrt[2]{7} \times 2\sqrt[2]{3} = 3 \times 2\sqrt[2]{7 \times 3}$
$\quad\quad\quad\boxed{= 6\sqrt[2]{21}}$

Multiply Coefficients
Multiply Radicands

$2 \times 5\sqrt{3} = \boxed{10\sqrt{3}}$ $17.32 = 17.32$ ✓
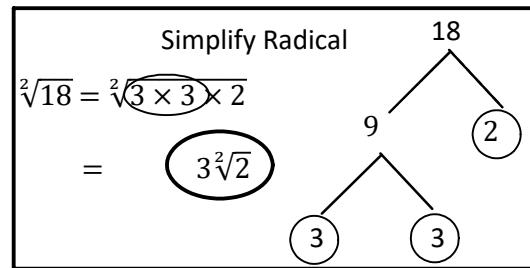
$2\sqrt{5} \times \sqrt{3} = \boxed{2\sqrt{15}}$ $7.75 = 7.75$ ✓

$27.50 = 27.50$ ✓

$5\sqrt[2]{6} \times 7\sqrt[2]{3} = 5 \times 7\sqrt[2]{6 \times 3}$
$\quad\quad = 35\sqrt[2]{18}$
$\quad\quad = 35 \times 3\sqrt[2]{2}$
$\quad\quad = \boxed{105\sqrt[2]{2}}$ $148.49 = 148.49$ ✓

Simplify Radical

$\sqrt[2]{18} = \sqrt[2]{3 \times 3 \times 2}$

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

18
├ 9 ── 3, 3
└ 2

$\sqrt[2]{5} \times \sqrt[3]{5} = \sqrt[2]{5} \times \sqrt[3]{5} = 5^{\frac{1}{2}} \times 5^{\frac{1}{3}} = \boxed{5^{\frac{5}{6}}}$

Can only multiply/divide like indexes.
Cannot multiply/divide unlike indexes. $3.82 = 3.82$ ✓
Change Form, Add Exponents

Distribute

$3(5 + \sqrt{2})$
$\boxed{15 + 3\sqrt{2}}$

$(5 + \sqrt{7})\sqrt{7}$
$\boxed{5\sqrt{7} + 7}$

$19.24 = 19.24$ ✓ $20.23 = 20.23$ ✓

FOIL

$(2 - \sqrt[2]{3}) \times (1 + \sqrt[2]{5})$

$\boxed{2 + 2\sqrt{5} - 1\sqrt{3} - \sqrt{15}}$

$0.867 = 0.867$ ✓

$(2 + \sqrt{3})^2$
$(2 + \sqrt{3})(2 + \sqrt{3})$
$\boxed{\dots}$

$\dfrac{\sqrt[2]{6}}{\sqrt[2]{3}} = \sqrt[2]{\dfrac{6}{3}}$

$\boxed{= \sqrt[2]{2}}$ $1.41 = 1.41$ ✓

$\dfrac{10\sqrt[2]{6}}{2\sqrt[2]{3}} = \dfrac{10}{2}\sqrt[2]{\dfrac{6}{3}}$

$\boxed{= 5\sqrt[2]{2}}$ $7.07 = 7.07$ ✓

$\dfrac{\sqrt{24}}{\sqrt{8}} = \dfrac{2\sqrt{6}}{2\sqrt{2}} = \dfrac{\sqrt{6}}{\sqrt{2}} = \sqrt{\dfrac{6}{2}} = \sqrt{3}$ $\dfrac{\sqrt{24} = 2\sqrt{6}}{\sqrt{8} = 2\sqrt{2}}$

OR

$\dfrac{\sqrt{24}}{\sqrt{8}} = \sqrt{\dfrac{24}{8}} = \sqrt{3}$ Simplify 1st