

OPERATIONS WITH
RADICALS
SECTION 12.2



Combining using Addition/Subtraction

- To combine by addition or subtraction, the number under the radical **MUST** be the same.
 - ▣ Reduce to make the number under the radical the same
 - ▣ Combine together using the appropriate operation

$$\sqrt{a} \cdot \sqrt{a} = 2\sqrt{a}$$

Examples

□ 1.) $3\sqrt{5} + 4\sqrt{5} =$ 2.) $\sqrt{6} - 4\sqrt{6} =$

□ 3.) $\sqrt{32} + \sqrt{2} =$ 4.) $\sqrt{28} - \sqrt{7} =$

Combining using Multiplication/Division

□ Multiplication:

- Multiply “like” numbers together

 - Inside with inside

 - Outside with outside

- Distribute/FOIL as is needed

- Simplify

□ Division:

- Multiply both the top and bottom by the radical on the bottom (can't have a radical on the bottom)

- Simplify

Examples

□ 1.) $3\sqrt{5} \cdot 4\sqrt{2} =$ 2.) $\sqrt{6} \cdot 4\sqrt{3} =$

□ 3.) $\sqrt{3}(\sqrt{5} - 7) =$ 4.) $\sqrt{2}(\sqrt{6} - \sqrt{3}) =$

Examples

□ 5. $(2 - \sqrt{5})^2$

6. $\frac{6}{\sqrt{5}}$

Examples

□ 7. $\frac{3}{\sqrt{6}}$

8. $\frac{4}{3\sqrt{2}}$

□ 9. $\frac{\sqrt{3}}{\sqrt{5}}$