# Add/Subtract Radicals

- In order to add/subtract expressions that contain radicals, the radicands MUST be identical . . . Aka. LIKE TERMS!

- Remember:
- $5x + 2x = 7x$
- So . . .

Treat the radical just like you would treat a variable.

$$5\sqrt{3} + 2\sqrt{3} = 7\sqrt{3}$$

# Can you add non-like terms?

- For instance: 4x + 3y
- NO!
- Likewise, you cannot add radicals w/ different radicands.

$$3\sqrt{2} + 4\sqrt{5}$$

Cannot add!
Leave like it is.

# You try.

- Add /Subtract.

1. $5\sqrt{6} - 2\sqrt{6}$
2. $5 + 6\sqrt{7} - 2\sqrt{7} - 3$
3. $8\sqrt{3} + 6\sqrt{2} - \sqrt{3} + 2\sqrt{2}$
4. $a\sqrt{x} + b\sqrt{x}$

**Answers!**

$3\sqrt{6}$

$2 + 4\sqrt{7}$

$7\sqrt{3} + 8\sqrt{2}$

$(a + b)\sqrt{x}$

# What if the radicands aren't =?

- Simplify all square roots first to see if the radicands are the same.
- For example: $5\sqrt{28} - 6\sqrt{48} + 10\sqrt{12}$

$$= 5\sqrt{2 \cdot 2 \cdot 7} - 6\sqrt{2 \cdot 2 \cdot 2 \cdot 2 \cdot 3} + 10\sqrt{2 \cdot 2 \cdot 3}$$

$$= 10\sqrt{7} - 24\sqrt{3} + 20\sqrt{3}$$

$$\boxed{= 10\sqrt{7} - 4\sqrt{3}}$$

# You Try!

Add.

$$\sqrt{80}+\sqrt{98}+\sqrt{128}$$

$$4\sqrt{5}+7\sqrt{2}+8\sqrt{2}$$

$$\boxed{4\sqrt{5}+15\sqrt{2}}$$

# Summarizer

A common mistake people make is to tell me that

$$2\sqrt{5} + 2\sqrt{5} = 4\sqrt{10}$$

Why is this not true?

Be sure to NOT do that because . . .

$$2\sqrt{5} + 2\sqrt{5} \neq 4\sqrt{10}$$