

### Warmup 5/(The first prime number)

1) The value of an irrational number expression is estimated to be between 18 and 19.

Which could be the expression? **Show work for EACH EXPRESSION!**

A.  $(\sqrt{2})^9$

B.  $(\sqrt{3})^5$

C.  $(\sqrt{6})^3$

D.  $(\sqrt{7})^3$

**Get a whiteboard!!!**

## Simplifying Radical Expressions

### Today's lesson...

• We will work on whiteboards again. However, if you know you will want problems to study from your notes, than you should write some stuff down yourself.

An expression that contains a radical sign ( $\sqrt{\quad}$ ) is a radical expression.

Examples of radical expressions:

$$\sqrt{14} \quad \sqrt{\ell^2 + w^2} \quad \sqrt{2gd} \quad \frac{\sqrt{d}}{4} \quad 5\sqrt{2} \quad \sqrt{18}$$

The expression under a radical sign is the radicand. A radicand may contain numbers, variables, or both. It may contain one term or more than one term.

You CAN add together like radicals

$$\text{Ex: } \sqrt{3} + 5\sqrt{3} = 6\sqrt{3}$$

$$5\sqrt{6} + 2\sqrt{6}$$

$$7\sqrt{6}$$

$$50\sqrt{7} - 25\sqrt{7}$$

$$25\sqrt{7}$$

$$18\sqrt{2} - 90\sqrt{7}$$

Unlike Radicals!  
Cannot add together.

$$10\sqrt{6} + \sqrt{6}$$

$$11\sqrt{6}$$

$$10\sqrt{3} + 6\sqrt{3}$$

$$16\sqrt{3}$$

$$12\sqrt{5} + 13\sqrt{5}$$

$$26\sqrt{5}$$

$$10\sqrt{2} + \sqrt{6}$$

Unlike Radicals

$$2\sqrt{9} - 9\sqrt{7}$$

Unlike Radicals!  
Cannot add together.

$$\text{Does } \sqrt{36} = \sqrt{25} + \sqrt{11}?$$

$$\text{Does } \sqrt{36} = \sqrt{9} \cdot \sqrt{4}?$$

**You can split up radicals into roots of their factors**

$$\blacksquare \sqrt{144} = \sqrt{36} \cdot \sqrt{4}$$

$$\sqrt{100} = \sqrt{20} \cdot \sqrt{5}$$

$$\sqrt{100} = \sqrt{25} \cdot \sqrt{4}$$

$$\sqrt{100} = \sqrt{10} \cdot \sqrt{10}$$

### Simplest Form

• An expression containing square roots is in simplest form when

- the radicand has no perfect square factors other than 1.

Simplify:

$$\begin{aligned} &\sqrt{18} \\ &\sqrt{9} \cdot \sqrt{2} \\ &3\sqrt{2} \end{aligned}$$

Simplify:

$$\sqrt{50}$$

$$5\sqrt{2}$$

Simplify:

$$\sqrt{48}$$

$$4\sqrt{3}$$

Simplify:

$$\sqrt{80}$$

$$4\sqrt{5}$$

Simplify:

$$\sqrt{52}$$

$$2\sqrt{13}$$

Simplify:

$$\sqrt{72}$$

$$6\sqrt{2}$$

Simplify:

$$\sqrt{24}$$

$$2\sqrt{6}$$

Simplify:

$$3\sqrt{24}$$

$$6\sqrt{6}$$

Simplify:

$$5\sqrt{24}$$

$$10\sqrt{6}$$

Simplify:

$$6\sqrt{200}$$

$$60\sqrt{2}$$

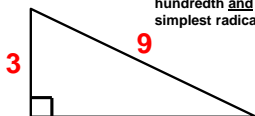
Simplify:

$$4\sqrt{50}$$

$$20\sqrt{2}$$

**Find the missing side.**

Give an estimate to the nearest hundredth and the exact answer in simplest radical form.



$$6\sqrt{2}$$