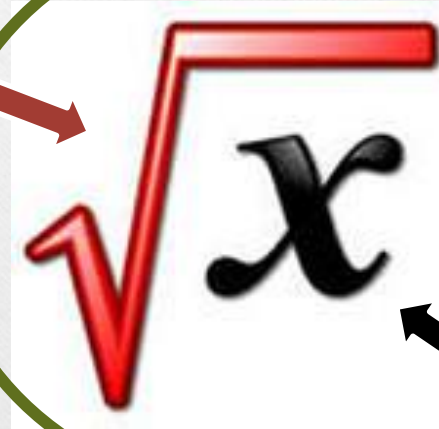Happy Birthday

John Louis von Neumann

"If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is."

Square Root Vocabulary

Radical sign

Radical expression

Radicand

Properties of Square Roots

- **Product Property**

$$\sqrt{xy} = \sqrt{x} \cdot \sqrt{y} \text{ where } x, y \geq 0$$

- **Quotient Property**

$$\sqrt{\frac{x}{y}} = \frac{\sqrt{x}}{\sqrt{y}} \text{ where } x \geq 0, y > 0$$

- **Square property**

$$\sqrt{x^2} = |x| \text{ for any real x}$$

Simplest form

- No *perfect square* factors are inside the radical.

- No *fractions* are in the radical.

- No radicals in the *denominator* of a fraction.

Warm up!

I. Read the expression and evaluate:
   a) 2^2
   b) $(-7)^2$
   c) $\sqrt{64}$
   d) $\sqrt{(-4)^2}$

II. Evaluate:
   a) $\sqrt{4 \cdot 49}$
   b) $\sqrt{0.25 \cdot 81}$

Warm up!

III. Calculate:

    a) $\sqrt{5{,}6^2}$

    b) $\sqrt{(-15)^2}$

IV. Simplify:

    a) $\sqrt{c^2}, \; c > 0$

    b) $\sqrt{y^2}, \; y < 0$

    c) $\sqrt{n^{10}}, \; n > 0$

    d) $\sqrt{m^6}, \; m < 0$

Compare

- $\sqrt{25}$ ❓ $\sqrt{16}$

  $\sqrt{8,2}$ ❓ $\sqrt{8,3}$

  $6\sqrt{3}$ ❓ $5\sqrt{3}$

  $\sqrt{72}$ ❓ $7\sqrt{2}$

Changing from entire to mixed radical

Changing from mixed to entire radical

Compare $\sqrt{72}$ and $7\sqrt{2}$

I method: *simplification* or *changing from entire to mixed radical.*

$$\sqrt{72} = \sqrt{36 \cdot 2} = \sqrt{36} \cdot \sqrt{2} = 6\sqrt{2}$$

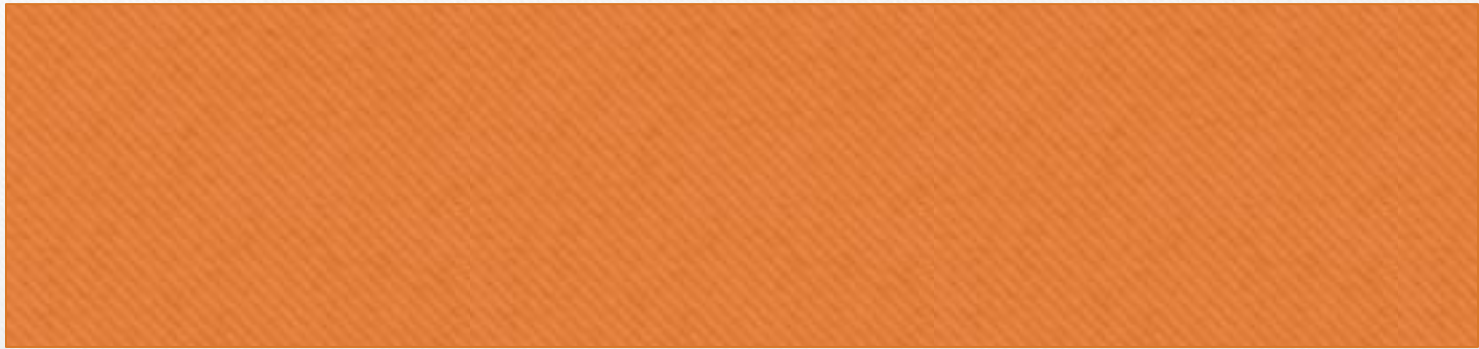$$6\sqrt{2} < 7\sqrt{2} \rightarrow \sqrt{72} < 7\sqrt{2}$$

II method: *changing from mixed to entire radical.*

$$7\sqrt{2} = \sqrt{49} \cdot \sqrt{2} = \sqrt{49 \cdot 2} = \sqrt{98}$$
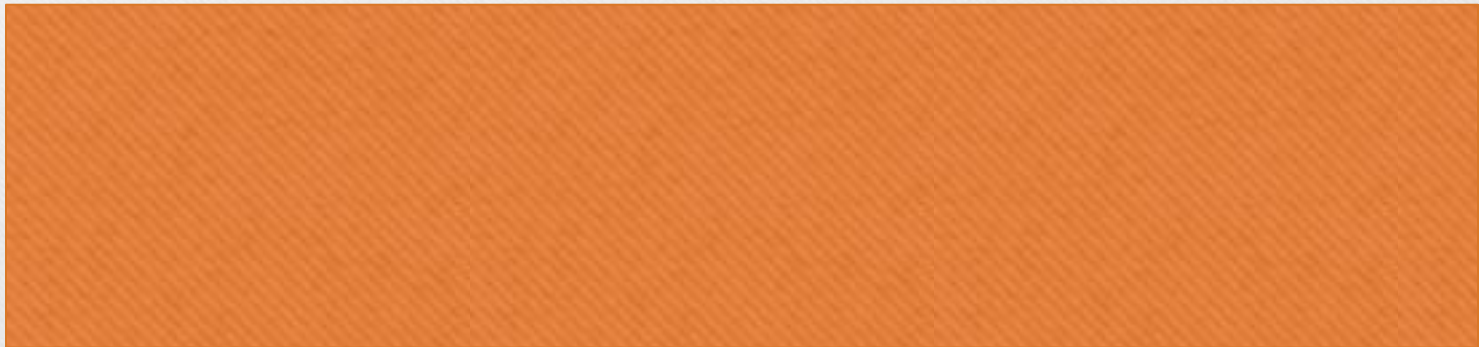
$$\sqrt{72} < \sqrt{98} \rightarrow \sqrt{72} < 7\sqrt{2}$$

Mixed and Entire Radicals

- Ex. Mixed: $4\sqrt{3}, 22\sqrt{7}, -3\sqrt{5}$.

-

- Ex. Entire: $\sqrt{36}, \sqrt{17}, -\sqrt{50}$.

-

Work plan:

1. Read the task

2. Solve the problems

3. Check yourself

5. Correction

4. Proceed to next block

6. Check yourself

7. Proceed to next block

8. Apply to a teacher