

2-1-3 Square Roots \sqrt{a}

$$\sqrt{9} = 3 \text{ because } 3 \text{ times } 3 \text{ is } 9$$

$$\sqrt{25} = 5 \text{ because } 5 \text{ times } 5 \text{ is } 25$$

When working a square root problem, ask:
"What times itself is the number inside the root symbol?"

Check a root by multiplying the answer by itself.

$$\sqrt{6.25} = 2.5 \text{ Check this by multiplying } 2.5 \times 2.5 \text{ to get } 6.25$$

Practice: Simplify the following.

Do these in your head: ask yourself what times itself is the number inside the root symbol.

$$\text{a) } \sqrt{4} = \quad \sqrt{36} = \quad \sqrt{100} = \quad \sqrt{9} =$$

$$\text{b) } \sqrt{49} = \quad \sqrt{121} = \quad \sqrt{16} = \quad \sqrt{144} =$$

$$\text{c) } \sqrt{25} = \quad \sqrt{81} = \quad \sqrt{169} = \quad \sqrt{1} =$$

$$\text{d) } \sqrt{\frac{4}{9}} = \quad \text{Hint: do the numerator and denominator separately.} \quad \sqrt{\frac{49}{81}}$$

Do these on a calculator. Round to the nearest hundredth.

$$\text{e) } \sqrt{5} = \quad \sqrt{55} = \quad \sqrt{130} = \quad \sqrt{10} =$$

$$\text{f) } \sqrt{79} = \quad \sqrt{150} = \quad \sqrt{30} = \quad \sqrt{105} =$$

What would you guess the square root is, without using a calculator, for the following? \approx means approximately equal to. Try one at a time and then see how close you were with your guess.

Example: $\sqrt{8}$ would be between $\sqrt{4}$ and $\sqrt{9}$. The answer is between 2 and 3. $\sqrt{8}$ is closer to $\sqrt{9}$ so the guess should be closer to 3. Maybe 2.9? How close is this to the calculator answer of 2.83?

If you are in a store and need an approximation to a square root that doesn't need to be to exact, you can guess close. An educated guess is called an estimate.

- g) $\sqrt{6} \approx$ $\sqrt{48} \approx$ $\sqrt{125} \approx$ $\sqrt{15} \approx$
h) $\sqrt{82} \approx$ $\sqrt{50} \approx$ $\sqrt{2} \approx$ $\sqrt{175} \approx$
i) $\sqrt{24} \approx$ $\sqrt{39} \approx$ $\sqrt{19} \approx$ $\sqrt{61} \approx$
j) $\sqrt{113} \approx$ $\sqrt{119} \approx$ $\sqrt{120} \approx$ $\sqrt{125} \approx$
k) $\sqrt{26} \approx$ $\sqrt{13} \approx$ $\sqrt{17} \approx$ $\sqrt{20} \approx$