Name: _____ Date: _____

Learning Goal 4.1	Identify and order irrational numbers.

A square root represents:

the side length of a given area.

side length = $\sqrt{\text{area}}$ for a square.

Many square roots result in irrational numbers., but we should not be too quick to judge! Especially without a calculator …

Example Consider the relationship between the following 4 numbers:

400 $= 4 \times 100$ $\sqrt{400} = 20$

40 $= 4 \times 10$

4 $\sqrt{4} = 2$

0.4 $= \frac{4}{10}$

0.04 $= \frac{4}{100}$ $\sqrt{0.04} = 0.2$

How many of these numbers have **rational square roots?** How many have **irrational square roots?** Why?

$400 = 2^4 \times 5^2$

$\sqrt{2^4 \times 5^2} = 2^2 \times 5$

$\frac{4}{100} = \frac{2^2}{2^2 \times 5^2} = \frac{1}{5^2}$

$\sqrt{\frac{1}{5^2}} = \frac{1}{5}$

Example Try again!

90 9 0.9 0.09 0.009 0.0009

How many of these numbers have **rational square roots?** How many have **irrational square roots?** Why?

$\sqrt{9} = 3$

$\sqrt{0.09} = 0.3$

$\sqrt{0.0009} = 0.03$.

$\sqrt{0.0009} = \sqrt{\frac{9}{10\,000}} = \sqrt{\frac{3^2}{10^4}} = \frac{3}{10^2} = 0.03$

Assignment p.206 #1-6 Quiz: Tomorrow!

Invert!

Example For each number below, write an equivalent form as the table specifies.

	As a square root	As a cube root	As a fourth root
5 =	$\sqrt{25}$	$\sqrt[3]{125} = \sqrt[3]{5^3}$	$\sqrt[4]{5^4} = \sqrt[4]{625}$
$\frac{5}{10}$ = 0.5 =	$\sqrt{\frac{5^2}{10^2}} = \sqrt{\frac{25}{100}} = \sqrt{0.25}$	$\sqrt[3]{\frac{5^3}{10^3}} = \sqrt[3]{\frac{125}{1000}} = \sqrt[3]{0.125}$	$\sqrt[4]{\frac{5^4}{10^4}} = \sqrt[4]{\frac{625}{10000}} = \sqrt[4]{0.0625}$
5×10 = 50 =	$\sqrt{5^2 \times 10^2} = \sqrt{2500}$		

Consider the numbers that have been given to you within your table group

1. Decide who among you has an irrational number
2. Place your 4 numbers in order from **smallest to biggest** on the number line below