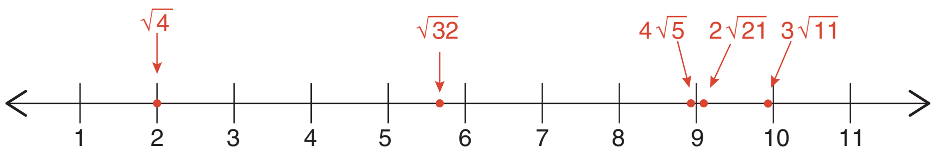
Using a calculator to determine the approximate value is another method to compare and order Irrational Numbers.

Example 3

Order the following numbers on the number line provided.

$2\sqrt{21}, 3\sqrt{11}, \sqrt{32}, \sqrt{4}, 4\sqrt{5}$

$2\sqrt{21}$	$= 2 \times \sqrt{21} = 2 \times 4.582575695... \doteq 9.2$
$3\sqrt{11}$	$= 3 \times \sqrt{11} = 3 \times 3.31662479... \doteq 9.9$
$\sqrt{32}$	$= 5.656854249... \doteq 5.7$
$\sqrt{4}$	$= 2$
$4\sqrt{5}$	$= 4 \times \sqrt{5} = 4 \times 2.236067977... \doteq 8.9$



Check Up

1. What are the benchmark values to use when estimating the value of $\sqrt{221}$?

2. Evaluate $\sqrt{221}$, to the nearest hundredth.

3. Classify each of the numbers listed in the table according to their Real Number subsets.

Number	Natural	Whole	Integers	Rational	Irrational	Real
$4.1\overline{98}$						
$\sqrt{256}$						
104						
$\sqrt[3]{125}$						
$\sqrt{8}$						
$-8\frac{2}{3}$						

☑ Compare your answers.

1. What are the benchmark values to use when estimating the value of $\sqrt{221}$?

   $\sqrt{196} < \sqrt{221} < \sqrt{225}$

2. Evaluate $\sqrt{221}$, to the nearest hundredth.

   14.87

3. Classify each of the numbers listed in the table according to their Real Number subsets.

Number	Natural	Whole	Integers	Rational	Irrational	Real
$4.1\overline{98}$				✓		✓
$\sqrt{256}$	✓	✓	✓	✓		✓
104	✓	✓	✓	✓		✓
$\sqrt[3]{125}$	✓	✓	✓	✓		✓
$\sqrt{8}$					✓	✓
$-8\frac{2}{3}$				✓		✓

Even though Irrational Numbers are aptly named, these complicated numbers do fit into a subset of the Real Number system. It is valuable to learn where and when Irrational Numbers arise as they fill the gaps in a number line and play significant roles in science and mathematics.

Multimedia

Additional video examples pertaining to this lesson are available.