8.NS.1 states "Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion that repeats eventually, and convert a decimal expansion which repeats eventually into a rational number."

8.NS.2 states "Use rational number approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions.

Write the word in the blank line that matches the definition.

1. An integer or a fraction; a real number that can be expressed as a fraction with a whole number in the numerator and a non-zero whole number in the denominator.
   \[
   \text{Rational number}
   \]

2. A number when multiplied by itself equals a given number. Example the \( \sqrt{4} = 2 \).
   \[
   \text{Square root}
   \]

3. A real number that cannot be expressed as a rational number; a real number that does not repeat or terminate.
   \[
   \text{Irrational number}
   \]

4. Plot each of the numbers on the number line below. Be sure to label each point.

\[
\begin{align*}
-\pi & \quad \sqrt{11} & \quad 2.74 & \quad -1.5 & \quad \sqrt{4} \\
-5 & \quad -4 & \quad -3 & \quad -2 & \quad -1 & \quad 0 & \quad 1 & \quad 2 & \quad 3 & \quad 4
\end{align*}
\]
5. What numbers above are rational?

\[2.19, -1.5, \sqrt{9}\]

6. What numbers above are irrational?

\[\pi, \sqrt{11}\]

7. Explain why you placed \(\sqrt{11}\) where you did using complete sentences.

Using estimation/approximation, I know \(\sqrt{9} = 3\) and \(\sqrt{16} = 4\). Since \(\sqrt{11}\) is between 3 and 4 and closer to 3, it is irrational.

Convert the following fractions to decimals. Show work. If needed, round irrational numbers to the hundredths place.

8. \[\frac{2}{5} = 0.4\]

9. \[\frac{7}{10} = 0.7\]

10. \[\frac{3}{8} = 0.375\]

Convert the following decimals to fractions. All fractions should be in simplest form.

11. \[0.6 = \frac{3}{5}\]

12. \[0.53 = \frac{53}{100} = \frac{53}{100} = \frac{53}{100} = \frac{53}{100}\]

13. \[0.375 = \frac{3}{8}\]
Place the numbers in all areas that they fit.

Real Numbers

\[
\begin{array}{c}
\sqrt{9} \\
\frac{22}{7} \\
\pi \\
\sqrt{15}
\end{array}
\]

Whole Numbers

\[
\begin{array}{c}
\sqrt{9} \\
\frac{22}{7} \\
\pi
\end{array}
\]

Integers

\[
\begin{array}{c}
\sqrt{9} \\
\frac{22}{7} \\
\pi
\end{array}
\]

Rational Numbers

\[
\begin{array}{c}
2.48 \\
-3.5
\end{array}
\]

Irrational Numbers

\[
\begin{array}{c}
\sqrt{15}
\end{array}
\]

14. \( \pi \)  
15. \( \sqrt{15} \)  
16. 2.48  
17. -3.5  
18. \( \sqrt{9} \)  
19. \( \frac{2\pi}{\pi} \)  

Simplifying the following radicals. Show work.

20. \( \sqrt{32} \)  
21. \( \sqrt{88} \)  
22. \( 5\sqrt{110} \)  
23. \( 3\sqrt{75} \)  

\[
\begin{array}{c}
3 \\
2 \\
10 \\
4 \\
4 \\
2 \\
2 \\
11
\end{array}
\]

\[
\begin{array}{c}
3 \\
2 \\
10 \\
4 \\
4 \\
2 \\
2 \\
11
\end{array}
\]
Unit 1 Test: The Number System

SUMMATIVE ASSESSMENT

CALCULATOR ALLOWED

8.NS.1 states "Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion that repeats eventually, and convert a decimal expansion which repeats eventually into a rational number".

8.NS.2 states "Use rational number approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions."

Use the number line to identify the amounts listed below. Then circle if the number is rational or irrational.

1. Identify $\sqrt{78}$: point A
   Rational or Irrational

2. Identify 1.25: point D
   Rational or Irrational

3. Identify $\frac{37}{5}$: point F
   Rational or Irrational

4. Identify $3\pi$: point C
   Rational or Irrational

5. Identify $\sqrt{121}$: point B
   Rational or Irrational

6. Identify 13.45: point E
   Rational or Irrational