Math 2 **N.RN.3**

Assessment Title: Irrational and Rational Numbers
Unit 1: Expanding the Number System

Learning Targets:

- Adding and multiplying two rational numbers results in a rational number.
- The result of adding a rational number and an irrational number is an irrational number.
- The result of multiplying a non-zero rational number to an irrational number is an irrational number.

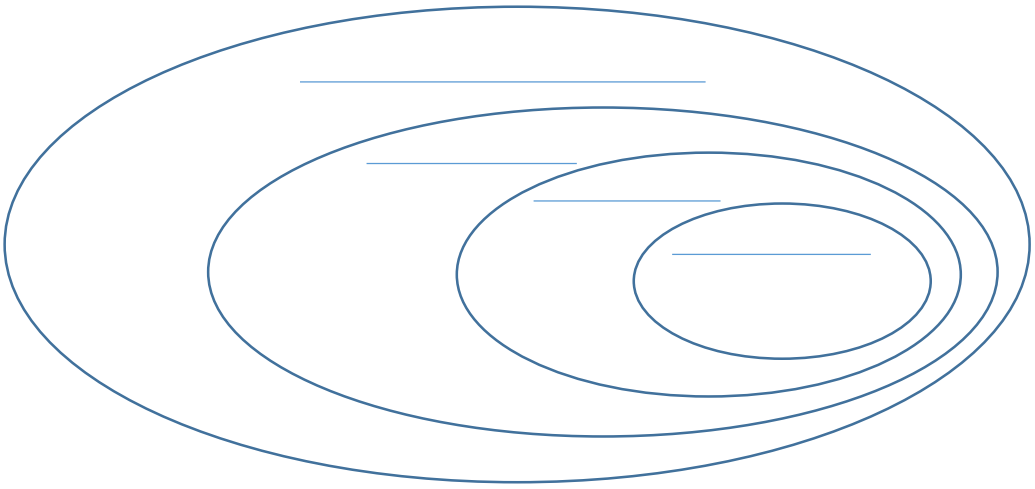
Part I: Learning About Number Sets

A _____ number is a number that you can express as $\frac{a}{b}$, where a and b are integers and $b \neq 0$.

This set of numbers contains several number sets we already know about. Using the word bank, complete the Venn Diagram below. Then, put 3 examples of each number type in its corresponding bubble.

Word Bank

Rational Numbers
Integers
Whole Numbers
Natural Numbers



*Write each number below as a fraction $(\frac{a}{b})$. Then, determine the **most specific** number set it is qualified to be in.*

1.341	$1.3 + 2.8$	$5\frac{2}{3}$
-5	10	-11.625

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Determine two different pairs of numbers from the set of rational numbers that satisfy each condition below. If there is no such pair, write 'not possible'.

1. Have a ***difference*** of 0.

2. Have a ***sum*** of 0.

3. Have a ***product*** that is an integer.

5. Have a ***quotient*** that is an integer.

6. Have a ***sum*** that is rational.

7. Make a conjecture about the sum of ***any two*** rational numbers. Justify your answer.

8. Make a conjecture about the product of ***any two*** rational numbers. Justify your answer.

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An _____ number is a number that cannot be expressed as a fraction. (This set of numbers includes non-repeating and non-terminating decimals).

In the box below, circle the numbers that qualify in this set of numbers.

$\sqrt{6}$	$\frac{17}{9}$	$\sqrt{144}$	11.55	π
$\sqrt{13}+\sqrt{13}$	$\sqrt{2.5^2}$	$\frac{91}{7}$	$1+\sqrt{6}$	

*Determine two different pairs of numbers, **1 rational and 1 irrational**, which satisfy each condition below. If there is no such pair, write 'not possible'.*

1. Have a ***difference*** of 0.

2. Have a ***sum*** of 0.

3. Have a ***sum*** that is irrational.

4. Have a ***product*** that is an integer.

5. Have a ***quotient*** that is an integer.

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6. Make a conjecture about the sum of any pair of one rational number and one irrational number. Justify your answer.

7. Make a conjecture about the product of one rational number and one irrational number. Justify your answer.

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Part II: Using Sets of Numbers

The set of _____ numbers includes all rational and real numbers.

Fill in each blank using A for Always, S for Sometimes, or N for Never. Justify your answer.

1. ____ Rational numbers are real numbers.

2. ____ Integers are rational numbers.

3. ____ Rational numbers are integers.

4. ____ Integers are irrational numbers.

5. ____ Real numbers are irrational numbers.

6. ____ Real numbers can be either irrational numbers or rational numbers.

Identify each number as rational or irrational. Justify your answer.

7. $\frac{13}{2}$ 8. -19.13 9. $\sqrt{17}$ 10. $\sqrt{121}$

11. $\sqrt{36-25}$ 12. $\frac{8.5}{7}$ 13. $\frac{13\pi}{2\pi}$