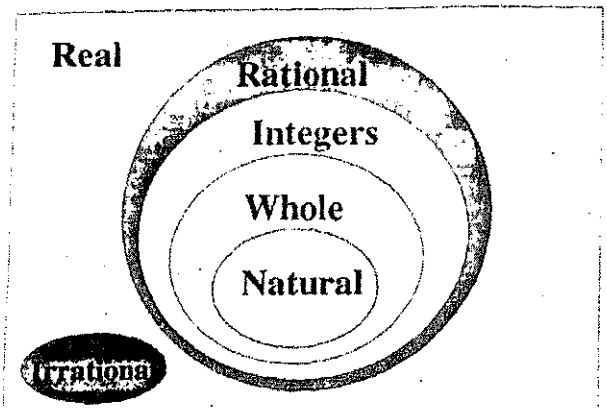
Answer Key

Rational vs. Irrational Numbers

Unit 2B packet



Natural Numbers: counting numbers starting from 1. No negative, no fractions, no decimals, no zero.

Whole Numbers: 0 and all natural numbers, no negatives, no fractions, no decimals

Integers: negative and positive numbers, no fractions, no decimals, includes all whole and natural numbers

Rational Numbers: a number that can be written as a fraction (repeating decimals, terminating decimals, includes all integers, whole numbers, and natural numbers

Irrational Numbers: non-repeating, non-terminating decimals (cannot be a fraction)

Real Numbers: either rational or irrational (all numbers we have learned so far)

Examples:

Natural Numbers:	1, 2, 3, 4, 5...
Whole Numbers:	0, 2, 3, 4...
Integers:	-2, -1, 0, 1, 2
Rational Numbers:	$\frac{1}{2}$, $.\overline{2}$, 3.678, -4
Irrational Numbers:	$\sqrt{17}$, 3.67894..., π
Real Numbers:	All of the Above

Directions: Classify each number according to its type. Some numbers may be more than one type.

1) - 250 int, rat	2) $\frac{11}{39}$ Rational (turns out to be repeat)	3) $\sqrt{9}$ Rational, int, whole, natural
4) 0.09 Rational	5) 0 Whole # integer rational	6) 27.5 Rational (terminating)
7) $-3\frac{2}{5}$ Rational	8) $12.\overline{8}$ rational (repeating)	9) π irrational
10) $-3.02\overline{59}$ rational (repeating)	11) 5.7189460..... irrational	12) $\sqrt{60}$ irrational

Attachment #8

Rational and Irrational Numbers

Name Key

Independent Practice

ANSWER KEY

1. Sort the numbers into 2 groups, rational or irrational. Write the numbers in the appropriate bubble.

0.8 $\sqrt{64}$ 0 $\sqrt{32}$ -19 $-\sqrt{100}$ 2.343443444…

$\frac{3}{7}$ $\sqrt{75}$ $6\frac{2}{7}$ $12.6\overline{7}$ $\sqrt{121}$ $\frac{12}{5}$ π

Rational

0.8 $\sqrt{64}$ 0 -19 $12.6\overline{7}$

$-\sqrt{100}$ $\frac{3}{7}$ $6\frac{2}{7}$ $\sqrt{121}$ $\frac{12}{5}$

Irrational

2.343443444… $\sqrt{32}$ $\sqrt{75}$

π

π

2. Graph and label each number on the number line below. You may label the number with the letter.

A 0.75

B $\sqrt{3}$

C $\sqrt{9}$

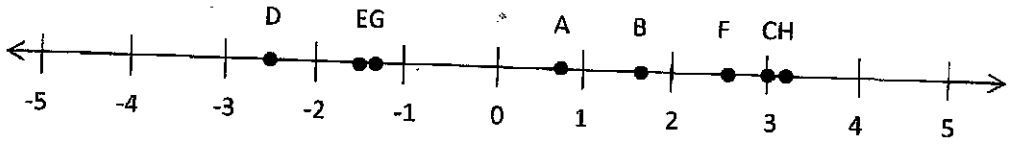
D $-2\frac{1}{2}$

E $-\frac{15}{10}$

F $2.\overline{6}$

G $-\sqrt{2}$

H π



Based on the above information, conjecture which of the statements is ALWAYS true, which is SOMETIMES true, and which is NEVER true?

1. The sum of a rational number and a rational number is rational.

   *Always True

   $2 + 2 = 4$

2. The sum of a rational number and an irrational number is irrational.

   *Always True

   $2 + \sqrt{2}$

3. The sum of an irrational number and an irrational number is irrational.

   * Sometimes true $\Rightarrow 3+2\sqrt{5} - 2\sqrt{5} = 0$

   -if irrational parts of the numbers have zero sum, the sum is rational

4. The product of a rational number and a rational number is rational.

   Always true

5. The product of a nonzero rational number and an irrational number is irrational.

   Sometimes true

   rational False $\sqrt{2} \cdot 0 = 0$

   True $2 \cdot \sqrt{2} = 2\sqrt{2}$ irrational

6. The product of an irrational number and an irrational number is irrational.

   Sometimes true

   False

   $\sqrt{2} \cdot \sqrt{8}$ = Rational

   True

   $\sqrt{3} \times \sqrt{8}$ = irrational