



7) Factor: A number that is Multiplied by another number to get a product.

Ex: 2 is a factor of 10 since  $2 \cdot 5 = 10$  {1, 2, 5, 10}

8) Operation: A process such as multiplication, Division, Addition, and Subtraction performed in a specific sequence. Known as PEMDAS or order of operations.

9) Perfect Square: The product of a number Squared. (When you multiply a number by itself)

Ex:  $3 \cdot 3 = 3^2 = 9$  P.S.

$6 \cdot 6 = 6^2 = 36$  P.S.

Calc button on calculator  
 $x^2$

\*The first 16 perfect squares are: {0, 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, ...}  
 $0^2, 1^2, 2^2, 3^2, 4^2, 5^2, 6^2, 7^2, 8^2, 9^2, 10^2, 11^2, 12^2, 13^2, 14^2, 15^2$

10) Square root: symbol:  $\sqrt{\quad}$  (called a radical) It is one of the two equal factors of a number. (The number you multiplied by itself to get the perfect square)

Ex:  $\sqrt{64} = 8$  S.R.

$\sqrt{144} = 12$  S.R.

Calc: on calculator  
2nd  $x^2$

11) Rational Number-

- Numbers that can be written as a fraction where the denominator is not 0  $\rightarrow$  Dividing by 0 makes it not real (error)

Ex:  $\frac{3}{4}, \frac{2}{9}$

- Integers + whole #'s

Ex: 5, -10

- Decimals that terminate or repeat

Ex: .75, .777, .3636, .6, .2, .645

- perfect square roots.

Ex:  $\sqrt{100} = 10$ ,  $\sqrt{36} = 6$  (square roots of perfect squares)

## 12) Irrational Number-

- Numbers that Can't be written as a fraction where the denominator is not 0

- non terminating and non repeating decimals

Ex: .7682493....

- non perfect square roots

Ex:  $\sqrt{7}$ ,  $\sqrt{15}$  (square roots of non-perfect squares)

- $\pi$  {3.1415926535...}

## 13) Real Number:

- rationals plus irrationals

- 0

- positives and negatives (integers)

- fractions and decimals

- whole numbers

## 14) Not Real:

- no division by 0

Ex:  $\frac{4}{0}$ ,  $-\frac{3}{0}$  (error)

- no negative radicands

Ex:  $\sqrt{-25}$ ,  $\sqrt{-10}$  (the radicands can't be negative)

$$5 \cdot 5 = 25$$

$$-5 \cdot -5 = 25$$

Name Key  
Mrs. Roumbos

Date \_\_\_\_\_  
8R Period \_\_\_\_\_

What are the sets of numbers?

Matching:

- |   |   |
|---|---|
| 1. Rational Numbers <u>E</u>              | A. {1, 2, 3, ...}                               |
| 2. Integers <u>B</u>                      | B. {... -3, -2, -1, 0, 1, 2, 3...}              |
| 3. Whole Numbers <u>D</u>                 | C. {Union of Rational & Irrational #'s}         |
| 4. Irrational Numbers <u>F</u>            | D. {0, 1, 2, 3 ...}                             |
| 5. Natural Numbers <u>A</u><br>(counting) | E. {The quotient of two integers}<br>(division) |
| 6. Real Numbers <u>C</u>                  | F. {Non-terminating, non-repeating decimals}    |

Fill Ins:

- Another name for the set of natural number is: counting numbers
- If zero is added to the set of natural numbers it becomes the set of whole #'s
- Even numbers are integers that are exactly divisible by 2.
- Odd numbers are integers that have a remainder of 1, when divided by 2.
- The set of whole numbers combines with their opposites are called: Integers
- A ratio is a fancy name for a: fraction
- What are the factors of 20: {1, 2, 4, 5, 10, 20}
- List the first 10 perfect squares {0, 1, 4, 9, 16, 25, 36, 49, 64, 81, 100}
- The opposite of squaring a number is called taking the square root

State whether the following are rational or irrational. Why?

- |   |  |   |
|---|--|---|
| 1) .36 <u>Rational</u><br>terminating decimal                               | 2) $\frac{1}{2}$ <u>Rational</u><br>- can be written as a fraction   | 3) .182640462... <u>Irrational</u><br>NON-terminating + NON-repeating decimal |
| 4) $\sqrt{17}$ <u>Irrational</u><br>NON-terminating & NON-repeating decimal | 5) .5555... <u>Rational</u><br>repeating decimal<br>$\left. \begin{array}{l} 5 \\ 363636 \end{array} \right\} e$ | 6) $\sqrt{64}$ <u>Rational</u><br>- can be written as a fraction              |
- 0.01010111... Irrat  $\rightarrow$  B/c you can't assume it repeats