Mariana is getting a small kennel for her new puppy to stay in. The kennel she bought says it is **9 square feet**. What does this mean? How much floor space does she need? That is, what are the dimensions of the kennel? Let's assume that the kennel has a square base.

Well, how do we tackle this? *Draw a picture?* Yes! Draw a square and label it as 9 ft^2. To solve this we need to work backwards. What number times itself equals 9?????

What we did to solve this problem was to take the **square root** of 9. A number that is multiplied by itself to form a product is called a **square root** of the product. *Here **3** is the square root of **9**.* The symbol for square root is: $\sqrt{}$ so: $\sqrt{9} = 3$

Inverse operations: Squaring a number and finding a square root are inverse operations. *The square root undoes the squaring.*

You must memorize the following table of **perfect squares** – a number whose positive square root is a whole number.

0	1	4	9	16	25	36	49	64	81	100
0^2	1^2	2^2	3^2	4^2	5^2	6^2	7^2	8^2	9^2	10^2

Simplify:
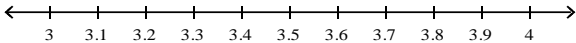
$\sqrt{49}=$ $\qquad\qquad$ $\sqrt{25}=$ $\qquad\qquad$ $\sqrt{9}=$ $\qquad\qquad$ $\sqrt{36}=$
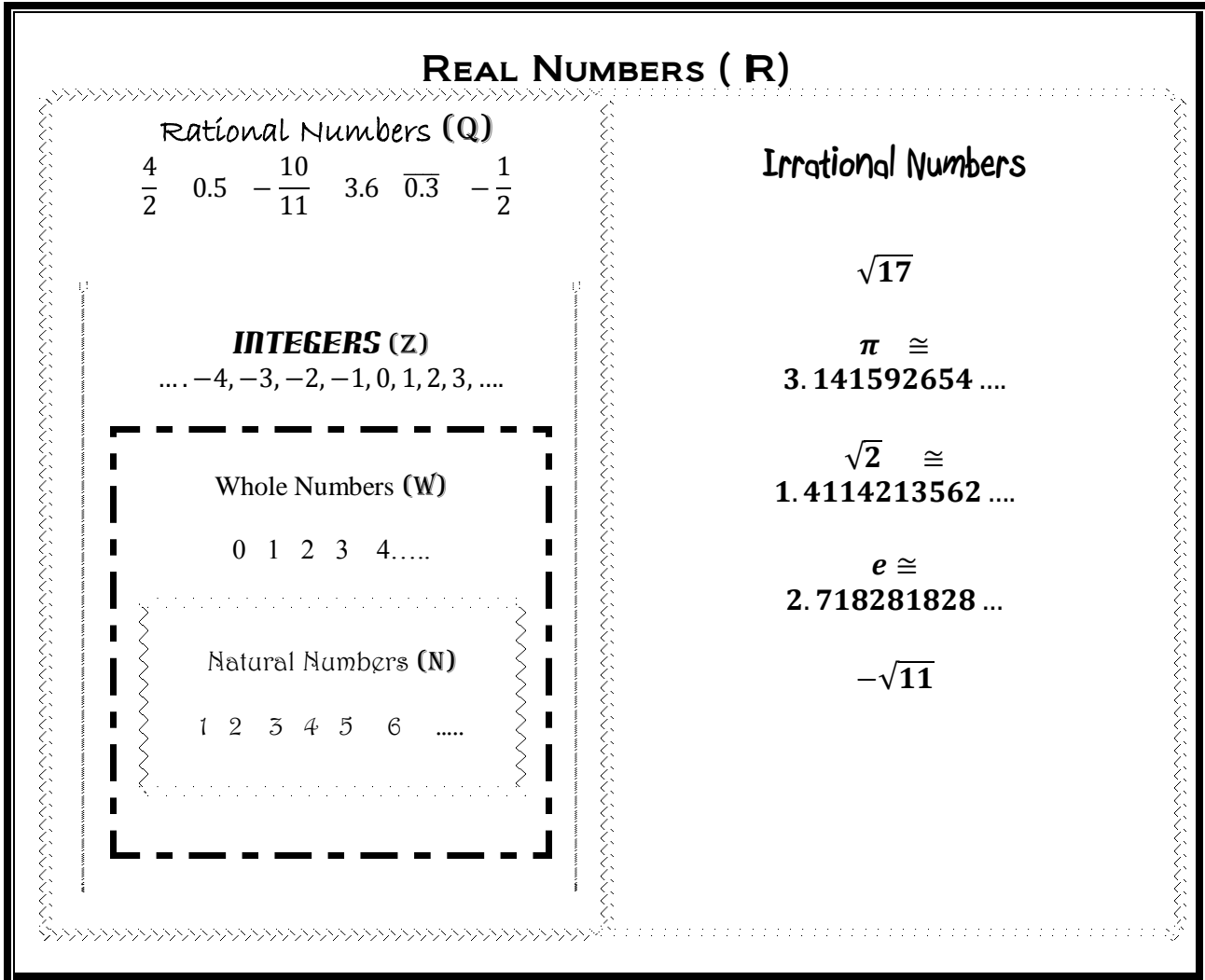
$\sqrt{11}=$

In the case of $\sqrt{11}$ there are two options. First we can estimate. Second, to have an exact answer we leave it as $\sqrt{11}$. LEAVE AS AN EXACT ANSWERS UNLESS YOU ARE TOLD TO ESTIMATE!

So estimate the value of $\sqrt{11}$ *to the nearest* $10th$	
$$\sqrt{9} < \sqrt{11} < \sqrt{16}$$ $\sqrt{9}$ $\qquad$ $\sqrt{11}$ $\qquad\qquad$ $\sqrt{16}$ 3 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4 Ans: $\sqrt{11} \cong 3.3$	1. Find the perfect squares that are less than and greater than your number 2. Plot out on a number line. 3. Guess to find numbers that might be close $\quad 3.3^2=10.89 \qquad 3.4^2=11.56$ 11 is closer to 10.89

Lady Bird Wildflower center sells bags of wildflower seeds. The bag says it will cover 19 ft^2. What approximate size square shaped area will Sara need to plant these seeds? Estimate to the nearest tenth of a foot.

Real Numbers: All numbers that can be located on the number line are called **real numbers**.

YOU NEED TO LEARN, OK, MEMORIZE *AND* UNDERSTAND THESE RELATIONSHIPS!!!

REAL NUMBERS (R)

Rational Numbers (Q)

$\frac{4}{2}$ 0.5 $-\frac{10}{11}$ 3.6 $\overline{0.3}$ $-\frac{1}{2}$

INTEGERS (Z)

$\ldots. -4, -3, -2, -1, 0, 1, 2, 3, \ldots.$

Whole Numbers (W)

$0 \quad 1 \quad 2 \quad 3 \quad 4\ldots..$

Natural Numbers (N)

$1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad \ldots..$

Irrational Numbers

$\sqrt{17}$

$\pi \cong 3.141592654\ldots.$

$\sqrt{2} \cong 1.4114213562\ldots.$

$e \cong 2.718281828\ldots$

$-\sqrt{11}$

Natural numbers: counting numbers

Whole numbers: counting numbers plus 0

Integers: whole numbers and negatives

Rational numbers: can be expressed as a fraction or a ratio; $\frac{a}{b}$ *a and b are integers but* $b \neq 0$

  Terminating decimals: a rational number expressed as a decimal and the decimal terminates: 2.34, 5.2

  Repeating decimal: a rational expressed as a decimal and the decimal repeats: $2.414141\overline{41}$. $0.333\overline{33}$

Irrational number: cannot be expressed as a fraction, it cannot be written as an exact number: $\sqrt{2}, \pi$ (they just go crazy or irrational!)

List all classifications that apply to each real number:

14 -5

$\sqrt{3}$ 0.5

¾   0.33333 (this is equal to?)