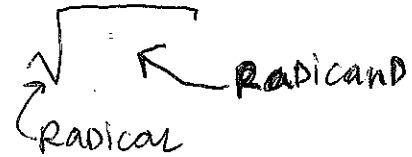


# Algebra IA

## Lesson 2.7

### Find Square Roots and Compare Real Numbers



#### Warm-Up

Evaluate each of the following for  $n = 3$  and  $m = 5$ .

(a)  $2n+5$

$$\begin{aligned} 2(3)+5 \\ 6+5 \\ 11 \end{aligned}$$

(b)  $n^2-3m$

$$\begin{aligned} (3)^2-3(5) \\ 9-15 \\ -6 \end{aligned}$$

(c)  $(m+n)^2$

$$\begin{aligned} (5+3)^2 \\ (8)^2 \\ 64 \end{aligned}$$

(d)  $m^2+5n$

$$\begin{aligned} (5)^2+5(3) \\ 25+15 \\ 40 \end{aligned}$$

#### Square Root of a Number

If  $b^2 = a$ , then  $b$  is a square root of  $a$ .

Example:  $4^2 = 16$  and  $(-4)^2 = 16$  so 4 and -4 are square roots of 16.

#### Example 1. Find Square Roots

Evaluate the expression.

(a)  $\sqrt{121}$   $11$

(b)  $-\sqrt{25}$   $-5$

(c)  $\sqrt{64}$   $8$

(d)  $\pm\sqrt{144}$   $\pm 12$

#### Example 2. Approximating a Square Root

Approximate the square root to the nearest integer.

(a)  $\sqrt{32} \approx 6$

$$\sqrt{25} < \sqrt{32} < \sqrt{36}$$

5                      6

(b)  $\sqrt{103} \approx 10$

$$\sqrt{100} < \sqrt{103} < \sqrt{121}$$

(c)  $-\sqrt{48} \approx -7$

$$-\sqrt{49} < -\sqrt{48} < -\sqrt{36}$$

-7   -6.9   -6

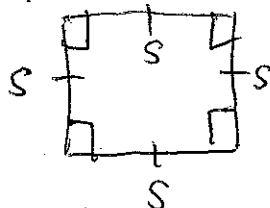
(d)  $-\sqrt{75} \approx -9$

$$-\sqrt{81} < -\sqrt{75} < -\sqrt{64}$$

#### Perfect Squares Table

$x$	$x^2$
0	0
1	1
2	4
3	9
4	16
5	25
6	36
7	49
8	64
9	81
10	100
11	121
12	144
13	169
14	196
15	225
16	256
17	289
18	324
19	361
20	400

(e) The top of a box is a square with an area of 320 square inches. Approximate the side length of the box top to the nearest inch.



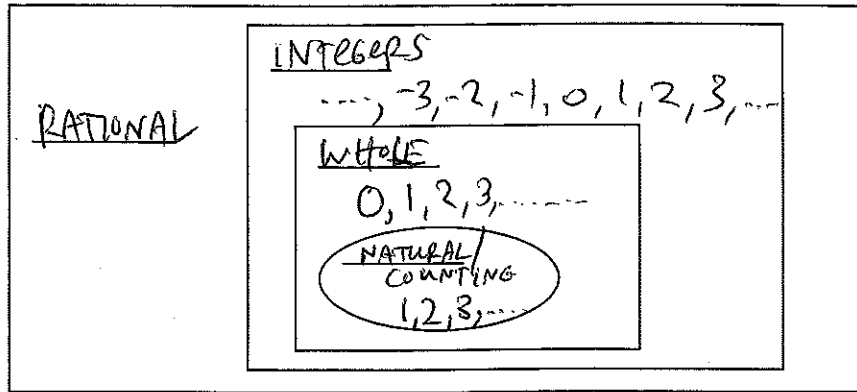
$$\begin{aligned} A &= 320 \text{ in}^2 \\ A &= s^2 \end{aligned}$$

$$\begin{aligned} \sqrt{s^2} &= \sqrt{320} \\ s &\approx 18 \end{aligned}$$

The side length of the square is about 18 inches

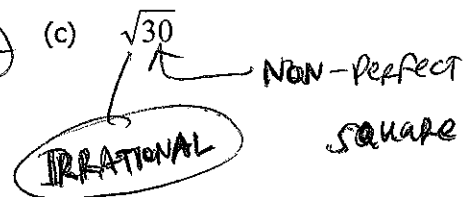
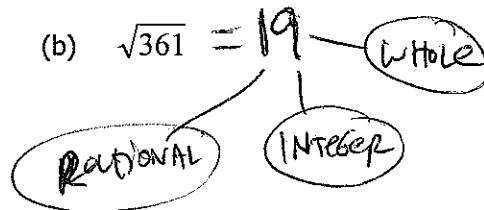
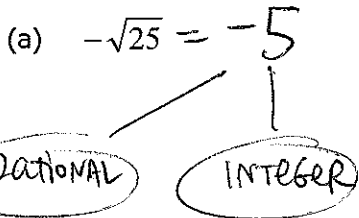
Real Numbers

IRRATIONAL  
DECIMAL THAT  
NEVER TERMINATES  
AND  
NEVER REPEATS



**Example 3. Classify Numbers**

Tell whether the following numbers are a rational number, an irrational number, an integer or a whole number.

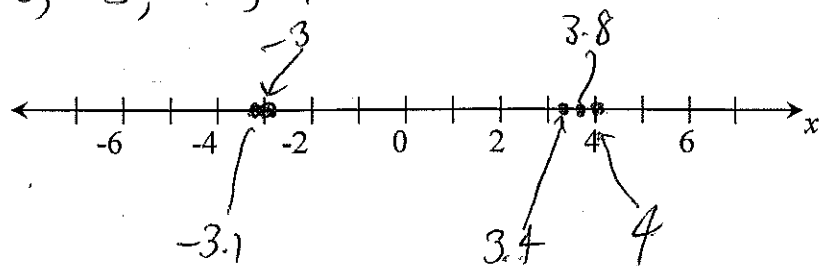


**Example 4. Graph and Order Real Numbers**

Order the numbers from least to greatest:  $-\sqrt{10}, \frac{19}{5}, -3, \sqrt{12}, \sqrt{16}$

$-3.1, 3.8, -3, 3.4, 4$

$-\sqrt{10}, -3, \sqrt{12}, \frac{19}{5}, \sqrt{16}$



**Assignment:** Page 113-114 (4 - 40) even

**Review:**

Translate each sentence into an equation or inequality.

1. 17 less than a number  $z$  is 9
2. 8 more than a number  $r$  is less than 17.
3. -3 is the sum of a number  $y$  and -6
4. -9 is equal to a number  $y$  decreased by 21.

Evaluate.

5.  $-8 + 4 - 9$
6.  $12 - (-8) - 5$
7.  $20 + (-17) - 8$