

## 8th Grade

## 3.3 Estimating Square Roots

Square Roots are inverses of any number to the 2nd power

Ex)  $\sqrt{9} \cdot 3^2$  are related because  $\sqrt{9} = 3$

List of perfect square's to memorize

$$\sqrt{4} = 2$$

$$\sqrt{9} = 3$$

$$\sqrt{16} = 4$$

$$\sqrt{25} = 5$$

$$\sqrt{36} = 6$$

$$\sqrt{49} = 7$$

$$\sqrt{64} = 8$$

$$\sqrt{81} = 9$$

$$\sqrt{100} = 10$$

$$\sqrt{121} = 11$$

$$\sqrt{144} = 12$$

$$\sqrt{169} = 13$$

$$\sqrt{196} = 14$$

$$\sqrt{225} = 15$$

$$\sqrt{256} = 16$$

$$\sqrt{289} = 17$$

$$\sqrt{324} = 18$$

$$\sqrt{361} = 19$$

$$\sqrt{400} = 20$$

$$\sqrt{441} = 21$$

$$\sqrt{484} = 22$$

$$\sqrt{529} = 23$$

$$\sqrt{576} = 24$$

$$\sqrt{625} = 25$$

## Writing Square Roots as a Decimal

So what if you have a square root of a number that is not a whole number answer?

$$\text{Ex) } \sqrt{6}$$

use estimation:

$$\sqrt{4} = 2 \quad \sqrt{6} \quad \sqrt{9} = 3$$

since 6 is between 4 and 9 then the answer has to be between 2 and 3 so 2. —

is 6 closer to 4 or 9? Or is it right in the middle?  
Choose .5

since it's closer to 4 but not by much I would choose .4 because it's just below the halfway mark.

$$\text{so try } 2.4^2$$

$$2.4^2 = 5.76$$

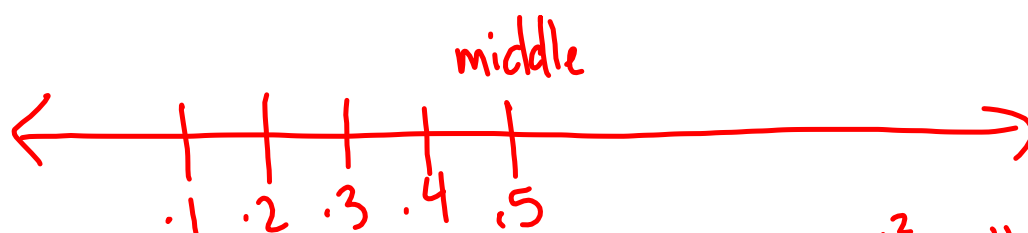
not exactly 6 so try  $2.5^2 = 6.25$ , since it goes over stick with 2.4

$$\text{So } \sqrt{6} \approx \boxed{2.4}$$

Ex) Approximate  $\sqrt{11}$ 

$$\sqrt{9} = 3 < \sqrt{11} \approx \text{b/t } 3 \text{ \& } 4 < \sqrt{16} = 4$$

$11 - 9 = 2$        $16 - 11 = 5$



$$\boxed{3.\underline{3}}$$

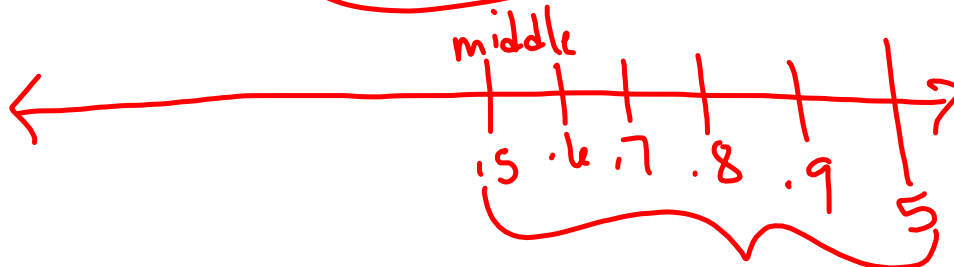
$$3.4^2 = 11.56$$
$$3.3^2 = 10.89$$

Ex) Approximate  $\sqrt{24}$

$$\sqrt{16} = 4 < \sqrt{24} < \sqrt{25} = 5$$

$24 - 16 = 8$                        $25 - 24 = 1$

4.8



$$4.9^2 = 24.01$$

$$4.8^2 = 23.04$$

Ex) Approximate  $\sqrt{22}$  to the nearest whole number.

$$\sqrt{16} = 4 < \sqrt{22} < \sqrt{25} = 5$$

$22 - 16 = 6$                        $25 - 22 = 3$

5

Ex) Approximate  $\sqrt{60}$  to the nearest whole number.

$\sqrt{49}$        $\sqrt{60}$        $\sqrt{64}$

*$\sqrt{60}$  is closer to*

8

## You Try:

1) Approximate to the nearest tenth.  $\sqrt{79}$

$$\sqrt{64} = 8$$

15

$$\sqrt{79}$$

$$\sqrt{81} = 9$$

2

$$8.8$$

2) Approximate to the nearest whole number.  $\sqrt{47}$

$$7$$

# Homework Worksheet



## 8th Grade

## 3.3 Estimating Square Roots

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

Estimate to the nearest tenth.

1)  $\sqrt{32}$

Estimate to the nearest whole #.

6)  $\sqrt{90}$

2)  $\sqrt{43}$

7)  $\sqrt{110}$

3)  $\sqrt{52}$

8)  $\sqrt{130}$

4)  $\sqrt{67}$

9)  $\sqrt{21}$

5)  $\sqrt{85}$

10)  $\sqrt{58}$