

## Estimating Irrational Square Roots (pp. 1 of 2)

**Example:** What is  $\sqrt{14}$  ?

**Steps:**

- Create a list of perfect squares or verbally build the perfect squares list until the value of the perfect square is greater than 14.
- Identify the two perfect squares that 14 is between.
- Identify the square roots of these two perfect squares.

$$\sqrt{9} = \underline{\hspace{2cm}}$$

$$\sqrt{16} = \underline{\hspace{2cm}}$$

- Sketch a number line. Make two hash marks on the number line and label the hash marks with the square roots of the perfect square whole numbers that  $\sqrt{14}$  is between.
- Make a hash mark halfway between the two labeled hash marks. Label this hash mark.
- Determine the “correct half of the half” for  $\sqrt{14}$  by determining whether  $\sqrt{14}$  is closer to  $\sqrt{9}$  or to  $\sqrt{16}$  and place a point on the number line.
- Write your estimated answer to the nearest tenth.

## Estimating Irrational Square Roots (pp. 2 of 2)

### Guided Practice:

- Identify the two integers that the square root is between.
- Locate the two integers on a number line.
- Locate the approximated square root on the number line between the two integers.
- Estimate the square root of each irrational number to the nearest tenth. Your answer must be on the correct “half of the half” between the two integers that are boundaries for the square root.

1.  $\sqrt{28}$

2.  $\sqrt{51}$

3.  $\sqrt{22}$

4.  $\sqrt{39}$

5.  $\sqrt{27}$

6.  $\sqrt{62}$

7.  $\sqrt{43}$

8.  $\sqrt{90}$

## Solving Problems with Irrationals (pp. 1 of 2)

Show all work. Justify your answers.

1. Which statement is TRUE?

- A. The  $\sqrt{18}$  is between 5 and 6.
- B. The  $\sqrt{33}$  is greater than 6.
- C. The  $\sqrt{11}$  is between 3 and 4.
- D. The  $\sqrt{10}$  is less than 3.

2. Which statement is FALSE?

- A. The  $\sqrt{52}$  is between 7 and 8.
- B. The  $\sqrt{45}$  is greater than 6.
- C. The  $\sqrt{83}$  is between 8 and 9.
- D. The  $\sqrt{13}$  is less than 4.

3. Mrs. Blalock tied her goat with a 12-foot rope to a stake in the field. The goat ate a circular area around the stake with a radius the length of the rope. Using 3.14 for  $\pi$ , what was the area of grass eaten by the goat?

- A. 452.16 ft<sup>2</sup>
- B. 37.68 ft<sup>2</sup>
- C. 1,419.78 ft<sup>2</sup>
- D. 113.04 ft<sup>2</sup>

## Solving Problems with Irrationals (pp. 2 of 2)

Show all work. Justify your answers.

4. After a crack in the sheetrock was repaired on the square wall behind the dining room table, Mrs. Gonzalez decided to go ahead and paint the wall. The area of the wall was  $78 \text{ ft}^2$ . What was the length of one side of the wall? (Choose the best estimate.)

- A. 7.8 ft
- B. 8.3 ft
- C. 9.2 ft
- D. 8.8 ft

5. Mr. Ramos is going to build a square-shaped game room onto his house. Mr. Ramos uses the formula for the area of a square to determine which of four given areas would give him a square room with a side length closest to 10 feet. The four areas are  $20 \text{ ft}^2$ ,  $98 \text{ ft}^2$ ,  $40 \text{ ft}^2$ , and  $115 \text{ ft}^2$ .

Which side length is closest to 10?

- A.  $\sqrt{20}$
- B.  $\sqrt{98}$
- C.  $\sqrt{40}$
- D.  $\sqrt{115}$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Class: \_\_\_\_\_

8th Grade  
Mathematics  
Unit: 03 Lesson: 01

### Irrational Square Roots Practice pp. 1 of 2

- Estimate the square root of each irrational number to the nearest tenth.
- Graph each answer on the number line. Your answer must be on the correct "half of the half" between the two integers that are boundaries for the square root.

1.  $\sqrt{11} \approx$  \_\_\_\_\_



2.  $\sqrt{7} \approx$  \_\_\_\_\_



3.  $\sqrt{29} \approx$  \_\_\_\_\_



4.  $\sqrt{2} \approx$  \_\_\_\_\_



5.  $\sqrt{61} \approx$  \_\_\_\_\_



6.  $\sqrt{32} \approx$  \_\_\_\_\_



7.  $\sqrt{14} \approx$  \_\_\_\_\_



8.  $\sqrt{20} \approx$  \_\_\_\_\_



9.  $\sqrt{85} \approx$  \_\_\_\_\_



10.  $\sqrt{90} \approx$  \_\_\_\_\_



11. Use a <sup>your brain</sup>calculator to compare the given pairs of numbers. Write <, >, = between each pair of numbers.

a)  $4\frac{5}{11}$  \_\_\_\_\_  $\sqrt{20}$

b)  $\sqrt{\frac{9}{25}}$  \_\_\_\_\_  $\sqrt{0.2}$

## Irrational Square Roots Practice pp. 2 of 2

12. Use a <sup>your brain</sup>calculator to compare the numbers below and graph the numbers in order on the given number line.

$$-1.6 \quad \frac{5}{3} \quad \sqrt{6} \quad 4.5 \quad -\frac{3}{2} \quad \sqrt{20} \quad \frac{5}{2}$$

