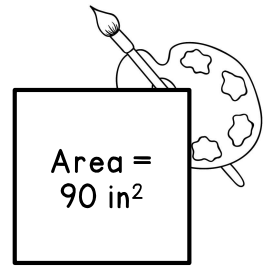Name _____

Date _____Pd_____

ESTIMATING SQUARE ROOTS

Jennifer is purchasing a square canvas for a custom artwork piece she will create. She wants the canvas to have a side length that is between 8 and 9 inches. She finds a canvas with the area shown at the right.

Area = 90 in²

a. Estimate the dimensions of the canvas. Explain your thinking.

b. Does the canvas meet Jennifer's requirements?

The area of the canvas above represents a _____ square. We can use our knowledge of perfect squares to estimate the square roots of non-perfect squares.

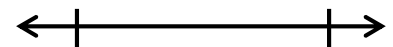| PERFECT SQUARES	NON-PERFECT SQUARES
• Numbers whose square roots are _____ _____. • Examples: _____ _____ _____	• Numbers whose square roots are not _____ _____. • Examples: _____ _____ _____

Use a number line and your knowledge of perfect squares to estimate each square root.

1. Estimate the value of $\sqrt{50}$.

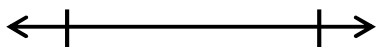a. Use the number line to locate the whole numbers that $\sqrt{50}$ should be between.

⟵————|——————————|——⟶

b. Which whole number will $\sqrt{50}$ be closer to? Explain.

c. Estimate $\sqrt{50}$ to the nearest tenth.
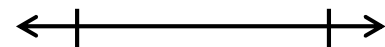
2. Estimate the value of $\sqrt{22}$.

⟵——|——————|——⟶

• $\sqrt{22}$ is between _____ and _____ , but closer to _____.

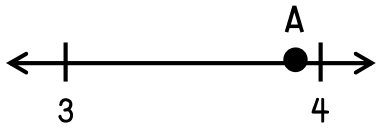• Decimal estimate: $\sqrt{22}$ ≈ _____.

3. Estimate the value of $\sqrt{103}$.

⟵——|——————|——⟶

• $\sqrt{103}$ is between _____ and _____ , but closer to _____.

• Decimal estimate: $\sqrt{103}$ ≈ _____.

4. Which of the following square roots is best represented by point A?

A

3   4

A. $\sqrt{7}$

B. $\sqrt{12}$

C. $\sqrt{15}$

D. $\sqrt{8}$

5. Which of the following would be the best estimate for $\sqrt{198}$?

A. 14.1

B. 14.5

C. 14.7

D. 15.1

6. Between which two integers would each of the following square roots lie?

a. $\sqrt{90}$ is between _____ and _____.

b. $\sqrt{175}$ is between _____ and _____.

c. $-\sqrt{12}$ is between _____ and _____.

7. Rebecca bought a square rug for her office. If the area of the rug is 65 ft^2, estimate the side length of the rug to the nearest tenth.

_____

8. Create and label a point on the number line below to represent an estimate of the following square roots:
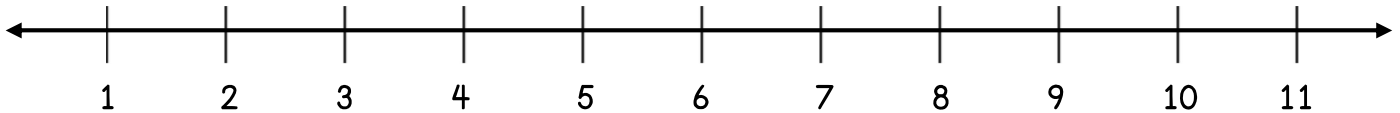
A: $\sqrt{5}$ B: $\sqrt{88}$ C: $\sqrt{17}$ D: $\sqrt{118}$ E: $\sqrt{56}$

1   2   3   4   5   6   7   8   9   10   11

9. Mark each statement below as true or false. If false, rewrite the statement correctly in the space below the statement.

_____ a. $\sqrt{202}$ is between 14 and 15, but closer to 15.

_____ b. $\sqrt{7}$ is between 3 and 4, but closer to 3.

_____ c. $\sqrt{99}$ is greater than 9.5.

Summarize today's lesson: