Name: _____

Square Roots Print Activity

Use the "Explore It" mode to check your solutions.

1.   A square has an area of 16 units^2.

    a.   What is the side length of a square of this area?

    b.   Draw a square of area 16 units^2 below.

    c.   What is the square root of 16?

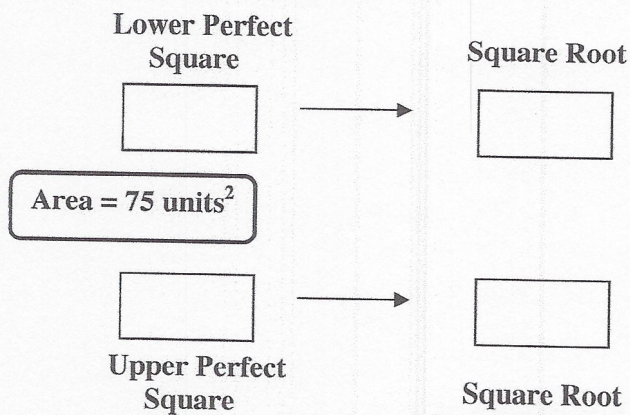   d.   Explain why your answers in parts (a) and (c) are the same.

2.   Complete the following table of perfect squares and their square roots:

Perfect Square	Square Root
1	1
4	2
9	3
36	
	8
100	
	13

3. A checkerboard is a square made up of 32 black and 32 red squares. Assume that each square has a side length of 1 unit.

    a. What is the total area of the checkerboard?

    b. What is the side length of the checkerboard?

    c. Explain how your answers in parts (a) and (b) help you determine the square root of 64.

4. The square roots of some numbers are not whole numbers. Suppose you construct a **square of area 75 units^2**.

    a. Fill in the blanks below:

    Lower Perfect Square   **Square Root**

    [ ]   ⟶   [ ]

    Area = 75 units^2

    [ ]   ⟶   [ ]

    Upper Perfect Square   **Square Root**

    b. Using the table completed in part (a), answer the following question:

    Which perfect square is closer to 75: the lower perfect square or the upper perfect square? Circle your answer below:

    Lower Perfect Square or Upper Perfect Square

    c. Estimate the square root of 75:

    $$\sqrt{75} = \underline{\hspace{2cm}}$$
    (nearest tenth)

d.   Can you use the same lower and upper perfect squares to estimate the value of $\sqrt{89}$? Explain why or why not.

5.   Fill in the blanks below to estimate the square roots of non-perfect squares:

a.   **Area = 108 units^2**

Lower Perfect Square   **Square Root**

$\boxed{}$ $\longrightarrow$ $\boxed{}$

$\boxed{\text{Area = 108 units}^2 \quad \blacktriangleright \quad \sqrt{108} = \boxed{} \atop \text{(nearest tenth)}}$

$\boxed{}$ $\longrightarrow$ $\boxed{}$

Upper Perfect Square   **Square Root**

b.   **Area = 12 units^2**

Lower Perfect Square   **Square Root**

$\boxed{}$ $\longrightarrow$ $\boxed{}$

$\boxed{\text{Area = 12 units}^2 \quad \blacktriangleright \quad \sqrt{12} = \boxed{} \atop \text{(nearest tenth)}}$

$\boxed{}$ $\longrightarrow$ $\boxed{}$

Upper Perfect Square   **Square Root**

c.   Area = 126.8 units^2

Lower Perfect
Square
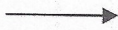
Square Root

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┌──────────┐         ┌──────────┐
│          │  ──→    │          │
└──────────┘         └──────────┘
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┌────────────────────────────────────────────────────────┐
│                                                          │
│  Area = 126.8 units$^2$  ━━▶    $\sqrt{126.8} =$  ┌────────┐ │
│                                                   │        │ │
│                                                   └────────┘ │
│                                                   (nearest tenth) │
└────────────────────────────────────────────────────────┘
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┌──────────┐         ┌──────────┐
│          │  ──→    │          │
└──────────┘         └──────────┘
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Upper Perfect
Square

Square Root

d.   Area = 46.2 units^2

Lower Perfect
Square
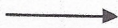
Square Root

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┌──────────┐         ┌──────────┐
│          │  ──→    │          │
└──────────┘         └──────────┘
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┌────────────────────────────────────────────────────────┐
│                                                          │
│  Area = 46.2 units$^2$  ━━▶    $\sqrt{46.2} =$  ┌────────┐   │
│                                                 │        │   │
│                                                 └────────┘   │
│                                                 (nearest tenth) │
└────────────────────────────────────────────────────────┘
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┌──────────┐         ┌──────────┐
│          │  ──→    │          │
└──────────┘         └──────────┘
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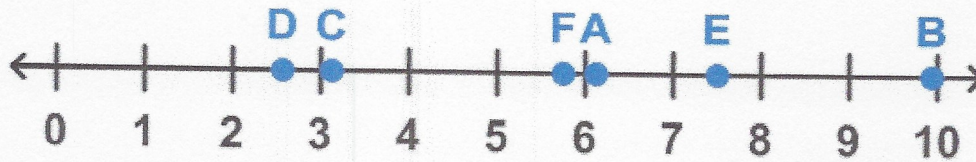
Upper Perfect
Square

Square Root

6. Which letter on the number line below corresponds to each square root?

$\sqrt{56}$ _____

$\sqrt{10}$ _____

$\sqrt{39}$ _____

$\sqrt{7}$ _____

$\sqrt{32}$ _____

$\sqrt{98}$ _____

7. The symbol $\sqrt{}$ means the positive or **principal square root** of a number.

a. Evaluate $\sqrt{121}$.

b. What is the negative square root of 121?

c. A square has an area of 121 units^2. What is the side length of a square of this area?

d. Explain why the answer to part (c) can only be the positive square root of 121.