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| <b>Cornell Notes</b><br> | <b>Topic/Objective: M7 L1 Square Roots</b><br>8.EE.A.2: Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$ , where $p$ is a positive rational number. Know that $\sqrt{2}$ is irrational.<br>a. Evaluate square roots of perfect squares less than or equal to 225.<br>b. Evaluate cube roots of perfect cubes less than or equal to 1000. | <b>Name:</b> _____<br><b>Class/Period:</b> _____<br><b>Date:</b> _____ |
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**Learning Target:** I can \_\_\_\_\_

**Questions:** \_\_\_\_\_ **Notes:** \_\_\_\_\_

**What is the inverse operation of squaring a number?** When you multiply a number by itself, you \_\_\_\_\_ the number.

Symbol for squaring is the exponent 2.  $4^2 = 4 \cdot 4 = 16$  4 squared is 16.

To "undo" this, take the \_\_\_\_\_ of the number.

Symbol for square root is a radical sign,  $\sqrt{\quad}$ .  $\sqrt{16} = \sqrt{4^2} = 4$  The square root of 16 is 4.

**What is a square root?** A square root of a number is a number that, when \_\_\_\_\_ by itself, equals the given number. Every positive number has a \_\_\_\_\_ and \_\_\_\_\_ square root.

**What is a perfect square?** A \_\_\_\_\_ is a number with integers as its square roots.

**1 Finding Square Roots of a Perfect Square**

**Find the two square roots of 49.** The square roots of 49 are \_\_\_\_\_  
 $7 \cdot 7 = 49$  and  $(-7) \cdot (-7) = 49$

The symbol  $\sqrt{\quad}$  is called a **radical sign**. It is used to represent a square root. The number under the radical sign is called the **radicand**.

**Study Tip**  
 Zero has one square root, which is 0.

| Positive Square Root, $\sqrt{\quad}$ | Negative Square Root, $-\sqrt{\quad}$ | Both Square Roots, $\pm\sqrt{\quad}$ |
|--------------------------------------|---------------------------------------|--------------------------------------|
| $\sqrt{16} = 4$                      | $-\sqrt{16} = -4$                     | $\pm\sqrt{16} = \pm 4$               |

**Summary:**  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Commented [ML(1)]: • find square roots of perfect squares.  
 • evaluate expressions involving square roots.

Commented [ML(2)]: square

Commented [ML(3)]: square root

Commented [ML(4)]: multiplied

Commented [ML(5)]: positive

Commented [ML(6)]: negative

Commented [ML(7)]: Write your own question.

Commented [ML(8)]: 7 and -7

| Questions: | Notes:  |
|------------|---|
|            | <b>2 Finding Square Roots</b>   |
|            | $\sqrt{25}$ represents the <i>positive</i> square root. $\sqrt{25}$   |
|            | $-\sqrt{\frac{9}{16}}$ represents the <i>negative</i> square root. $-\sqrt{\frac{9}{16}}$                   |
|            | $\pm\sqrt{2.25}$ represents both the <i>positive</i> and the <i>negative</i> square roots. $\pm\sqrt{2.25}$ |
|            | <b>On Your Own</b>  |
|            | <b>Find the two square roots of the number.</b>   |
|            | 1. 36                      2. 100                      3. 121   |
|            | <b>Find the square root(s).</b>   |
|            | 4. $-\sqrt{1}$ 5. $\pm\sqrt{\frac{4}{25}}$ 6. $\sqrt{12.25}$  |

Commented [ML(9): 6 and -6  
10 and -10  
11 and -11

Commented [ML(10): -1  
+2/5  
3.5


**Find the two square roots of the number.**

7. 9                      8. 64                      9. 4                      10. 144


**Find the square root(s).**

11.  $\sqrt{625}$                       12.  $\pm\sqrt{196}$                       13.  $\pm\sqrt{\frac{1}{961}}$                       14.  $-\sqrt{\frac{9}{100}}$   
 15.  $\pm\sqrt{4.84}$                       16.  $\sqrt{7.29}$                       17.  $-\sqrt{361}$                       18.  $-\sqrt{2.25}$

19. **ERROR ANALYSIS** Describe and correct the error in finding the square roots.

  $\pm\sqrt{\frac{1}{4}} = \frac{1}{2}$

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| <b>Cornell Notes</b><br> | <b>Topic/Objective: M7 L1 Square Roots Classwork</b>   | <b>Name:</b>         |
|  | 8.EE.A.2: Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$ , where $p$ is a positive rational number. Know that $\sqrt{2}$ is irrational. | <b>Class/Period:</b> |
|  | a. Evaluate square roots of perfect squares less than or equal to 225.<br>b. Evaluate cube roots of perfect cubes less than or equal to 1000.  | <b>Date:</b>         |

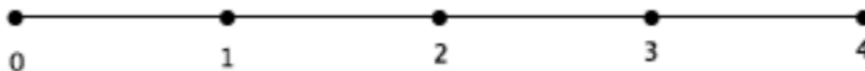
**Commented [ML(11)]:** • find square roots of perfect squares.  
 • evaluate expressions involving square roots.

## Classwork

### Exercises 1–4

- Determine the positive square root of 81, if it exists. Explain.
  
- Determine the positive square root of 225, if it exists. Explain.
  
- Determine the positive square root of  $-36$ , if it exists. Explain.
  
- Determine the positive square root of 49, if it exists. Explain.

### Discussion



### Exercises 5–9

Determine the positive square root of the number given. If the number is not a perfect square, determine which whole number the square root would be closest to, and then use *guess and check* to give an approximate answer to one or two decimal places.

5.  $\sqrt{49}$

6.  $\sqrt{62}$

7.  $\sqrt{122}$

8.  $\sqrt{400}$

9. Which of the numbers in Exercises 5–8 are not perfect squares? Explain.

## M7 L1 Square Roots Exit Ticket

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

### Exit Ticket

1. Write the positive square root of a number  $x$  in symbolic notation.
2. Determine the positive square root of 196. Explain.
3. The positive square root of 50 is not an integer. Which whole number does the value of  $\sqrt{50}$  lie closest to? Explain.
4. Place the following numbers on the number line in approximately the correct positions:  $\sqrt{16}$ ,  $\sqrt{9}$ ,  $\sqrt{11}$ , and 3.5.

