

4F**Estimating Square Roots**

Standards

M8N1.c, M8N1.f,
M8N1.k

Knowing the square numbers can help you estimate square roots.

1. Complete the table of squares.

1^2	2^2	3^2	4^2	5^2	6^2	7^2	8^2	9^2	10^2
1									

11^2	12^2	13^2	14^2	15^2	16^2	17^2	18^2	19^2	20^2
121									

Use the table of squares above to help you estimate each square root to the nearest tenth.

✓ _____ Round to two decimal places.

	Square Root	Estimate
2.	$\sqrt{10}$	
3.	$\sqrt{20}$	
4.	$\sqrt{200}$	
5.	$\sqrt{300}$	
6.	$\sqrt{57}$	
7.	$\sqrt{130}$	

Think and Discuss _____

8. **Discuss** your strategy for estimating square roots.

Explain your strategy below. Use complete sentences!

To locate a square root between two integers, refer to the table.

Number	1	2	3	4	5	6	7	8	9	10
Square	1	4	9	16	25	36	49	64	81	100
Number	11	12	13	14	15	16	17	18	19	20
Square	121	144	169	196	225	256	289	324	361	400

Locate $\sqrt{260}$ between two integers.

$$260 \text{ is between the perfect squares } 256 \text{ and } 289: \quad 256 < 260 < 289$$

$$\text{So: } \sqrt{256} < \sqrt{260} < \sqrt{289}$$

$$\text{And: } 16 < \sqrt{260} < 17$$

Use the table to complete the statements.

1. _____ < 39 $<$ _____

_____ $< \sqrt{39}$ $<$ _____

_____ $< \sqrt{39}$ $<$ _____

2. _____ < 130 $<$ _____

_____ $< \sqrt{130}$ $<$ _____

_____ $< \sqrt{130}$ $<$ _____

After locating a square root between two integers, you can determine which of the two integers the square root is closer to.

$$27 \text{ is between the perfect squares } 25 \text{ and } 36: \quad 25 < 27 < 36$$

$$\text{So: } \sqrt{25} < \sqrt{27} < \sqrt{36}$$

$$\text{And: } 5 < \sqrt{27} < 6$$

The difference between 27 and 25 is 2;
the difference between 36 and 27 is 9.
So, $\sqrt{27}$, is closer to 5.

$$25 < 27 < 36$$

$$2 \quad 9$$

Complete the statements.

3. $100 < 106 < 121$

_____ $< \sqrt{106}$ $<$ _____

_____ $< \sqrt{106}$ $<$ _____

$106 - 100 =$ _____

$121 - 106 =$ _____

$\sqrt{106}$ is closer to _____ than _____

4. _____ $< 250 <$ _____

_____ $< \sqrt{250}$ $<$ _____

_____ $< \sqrt{250}$ $<$ _____

$250 -$ _____ $=$ _____

_____ $- 250 =$ _____

$\sqrt{250}$ is closer to _____ than _____

Name _____ Period _____ Date _____

Each square root is between two integers. Name the integers.

1. $\sqrt{10}$

2. $\sqrt{24}$

3. $\sqrt{51}$

4. $\sqrt{39}$

Find each value to the nearest tenth.

9. $\sqrt{18}$

10. $\sqrt{63}$

11. $\sqrt{19}$

12. $\sqrt{41}$

The length of the hypotenuse of a right triangle is the square root of the sum of the squares of the measures of the other two legs of the triangle. Approximate the length of the hypotenuse of a right triangle if the legs have measures 12 and 15.