

Activity 6: Square Numbers and Roots

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CALCULATORS: Casio: *fx-260 Solar* • Casio: *fx-260 Solar School*

Teaching Notes

Grade Level: Middle School

Topic: Geometry and Measurement

Objective: *To use the x^2 key to find the area of a square. To use the square root key to find the base or height measure of a square of given area.*

Using the Activity:

The first part of this activity begins with a review of how to find the area of a square.

The formula typically used is $A = b/h^2$, where b/h is the base or height measure of the square.

Since the *fx-260* calculator has a x^2 key, the area can be computed by using the following series of keystrokes.

Enter: **b/h** x^2 and the *fx-260* calculator will display the area of the square.

The second part of the activity reverses the process investigating the use of the square root key. Finding the square root of a number is the inverse process to squaring a number. Hence, since the area represents the square of the base or height measure, to find the base or height measure you take the square root of the area. After finding the square root of the area, students should square the number to verify that the two processes are inverses of each other.

There are many numbers that students ought to be able to find the square root of without having to use a calculator. For example, the square root of 49 is 7, since 7^2 or $7 \times 7 = 49$. Have students to tell you the square roots of 16, 25, 64, and 81 without using their calculator.

Answers:

Base or Height Measure	Area
1. 28 units	784 sq. units
2. 36 units	1296 sq. units
3. 44 units	1936 sq. units

Area	Base or Height Measure
4. 361 sq. units	19 units
5. 1024 sq. units	32 units
6. 5329 sq. units	73 units
7. 2916 sq. units	54 units
8. 200 sq. units	14.1 units
9. 156.25 sq. units	12.5 units

Extension:

In this section, students should recognize that the area of C is greater than the area of A, but is less than the area of B. Hence, the area of C must be between 1 and 4. Visually, if the area of C is subdivided into 4 triangular regions by introducing diagonals, the students should see that the 4 resulting regions can be combined to form 2 unit squares. Hence, the area is 2 square units. Using the square root key on the calculator, it follows that the base or height to the nearest tenth is 1.41 units.

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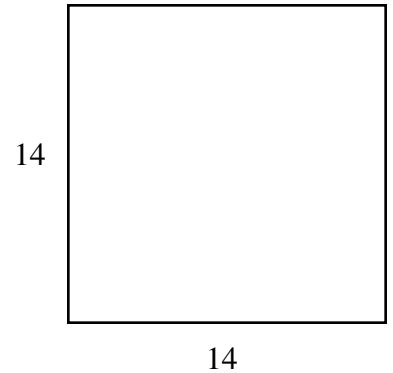
Student Worksheet Activity 6

The area of a square is found by multiplying its base by its height.

The area of the given square = 14 units x 14 units = 196 square units.

On the *fx-260* calculator, you can use the x^2 key to compute the area.

Enter: **14** x^2 The calculator displays 196.



Find the area of a square with given base or height measure.

Base or Height Measure	Area
1. 28 units	
2. 36 units	
3. 44 units	

If you know the area of the square and need to find the length of the base or height, the $\sqrt{\quad}$ key on the *fx-260* calculator can be used.

Square root ($\sqrt{\quad}$) tells you what number multiplied by itself gives you the indicated value. Since the base and height of a square have equal measure, the area is the product of a number times itself.

If the area of a square is 441 square units, what is the length of its base?

Enter: **441** **shift** $\sqrt{\quad}$ The calculator displays 21.

A square with a base or height measure of 21 units has an area of 441 square units.

Use your *fx-260* calculator to find the base or height of a square with given area. Round to the nearest tenth.

Area	Base or Height Measure
4. 361 sq. units	
5. 1024 sq. units	
6. 5329 sq. units	
7. 2916 sq. units	
8. 200 sq. units	
9. 156.25 sq. units	

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Student Worksheet Activity 6 (continued)

Extension:

If the area of square A = 1 square unit and the area of square B = 4 square units, find the area of square C and the base or height of square C.

