

Name _____ Date _____

Could It Be Groovy to Be a Square? Approximating and Rewriting Radicals

1. Zi wants to use paving stones to create a circular patio in her backyard. She knows that she has enough stones to cover 345.4 square feet. Estimate the maximum diameter Zi can make her patio. Use 3.14 for π . Show your work.

2. You can approximate the square roots of numbers that are not perfect squares.

- a. Determine the approximate value of the square root of 14. Show your work.

- b. Gabriel claims that you can use the algorithm below to approximate the square root of a number. The work for how to use Gabriel's algorithm to determine the square root of 14 is shown.

Step 1	Starting number	14
Step 2	Guess what the square root might be.	3.5
Step 3	Divide the starting number by your guess.	$14 \div 3.5 = 4$
Step 4	Calculate the average of your guess and the quotient of Step 3.	$\frac{3.5 + 4}{2} = 3.75$
Step 5	Use the result of Step 4 as your new guess and repeat Steps 3 and 4.	$14 \div 3.75 \approx 3.73333$ $\frac{3.75 + 3.73333}{2} \approx 3.74167$

How do your results compare to Gabriel's results?

c. Analyze Gabriel's algorithm, and explain why it works.

d. Use Gabriel's algorithm to calculate the square root of 29. Show your work.

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3. Michael is installing new baseboard in his living room. The living room is a square and he knows that it is 720 square feet. He needs to determine the length of each wall, so that he'll know how long each piece of baseboard needs to be.
- a. Determine the exact length of the baseboard for each wall. Show your work.
- b. Will determining the exact length or an approximate length be most helpful in cutting the baseboard? Explain your reasoning.