



Approximating Square Roots (page 1)

You can use perfect squares to approximate the square root of a number.

Example: $\sqrt{73}$ is between two consecutive integers. Name the integers.

Find the perfect square that is closest but *less* than 73. Think 64.

Next find the perfect square closest but *greater* than 73. Think 81.

$$64 < 73 < 81$$

$$\sqrt{64} < \sqrt{73} < \sqrt{81}$$

$$8 < \sqrt{73} < 9$$

$\sqrt{73}$ is between **8** and **9** (because 73 is between 64 and 81)

Example: Approximate $\sqrt{53}$.

Step 1: Find the whole number part of the answer.

Find the perfect square that is closest but less than 53. That would be 49. The perfect square closest to 53 but greater than 53 is 64. So, 53 is between 49 and 64.

$$49 < 53 < 64$$

$$\sqrt{49} < \sqrt{53} < \sqrt{64}$$

$$7 < \sqrt{53} < 8$$

Since $\sqrt{53}$ is between 7 and 8, the whole number part of our answer is 7.

Step 2: Find the decimal part of the answer:

$$\sqrt{49} < \sqrt{53} < \sqrt{64}$$

$$\left. \begin{array}{l} \sqrt{49} \\ \sqrt{53} \\ \sqrt{64} \end{array} \right\} 4 \left. \vphantom{\begin{array}{l} \sqrt{49} \\ \sqrt{53} \\ \sqrt{64} \end{array}} \right\} 15$$

Determine the difference between 49 (smaller perfect square) and 53 (the radicand). The difference is 4.

Then find the difference between 49 (smaller perfect square) and 64 (the larger perfect square). The difference is 15.

To approximate the decimal, write the ratio $\frac{4}{15}$. Divide to find

the approximate value. $\frac{4}{15} \approx .27$

Step 3: Find the approximate answer: $7 + .27 = 7.27$

The approximate value of $\sqrt{53}$ is 7.27.

Approximating Square Roots (page 2)

Each square root is between two consecutive integers. Name the integers. Show your work.

1. $\sqrt{40}$

2. $\sqrt{156}$

3. $\sqrt{250}$

Approximate each square root to the nearest hundredth.

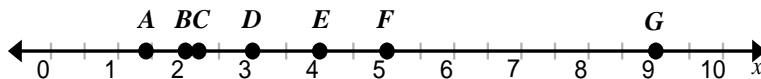
4. $\sqrt{19}$

5. $\sqrt{123}$

6. $\sqrt{259}$

7. You want to install a small square window that has an area of 350 square inches. What is the length (to the nearest tenth) of each side?

8. Points A , B , C , D , E , F and G are plotted on the number line below:



- Which point on the number line most closely represents $\sqrt{2}$?
- Which point on the number line most closely represents $\sqrt{5}$?
- Which point on the number line most closely represents $\sqrt{9}$?