

Calculating Square Roots To The Nearest Tenth

Name: _____ Class: _____ Date: _____

The easiest way to find the square root is to use a calculator but if you do not have one, you have to approximate it. In fact, calculating it to the nearest 10th is an expectation in Grade 8. Here is how we do it:

It is important to set this up in your book so that you have lots of room. There are a number of steps – you can do this.

Let's start with a number like 110.

Step 1. Write the number in a square root in the center of your page like this:

$$\sqrt{110}$$

Step 2. Write the perfect square that is lower to the left and the perfect square that is higher to the right – it should look like this:

$$\sqrt{100}$$

$$\sqrt{110}$$

$$\sqrt{121}$$

Step 3. Write in the square root for each perfect square below each one:

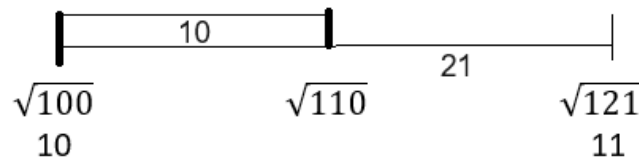
$$\begin{array}{c} \sqrt{100} \\ 10 \end{array}$$

$$\sqrt{110}$$

$$\begin{array}{c} \sqrt{121} \\ 11 \end{array}$$

From this we can see that the square root of 110 is between 10 and 11.

Step 4. Now, we approximate how far along we are from the lower number 100 to the next number 121. We are 10 of 21 spaces or 10/21 of the way along. That is about 0.5 (0.4761904 ish). Therefore the square root of 110 is close to 10.5.

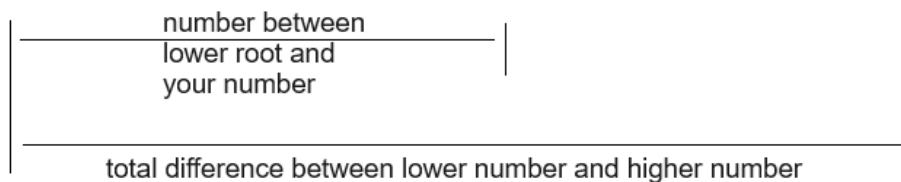


Step 5. Here we check our work to see if we are close. We square our 10.5 to see how close we are.

$$\begin{array}{r}
 10.5 \\
 \times 10.5 \\
 \hline
 525 \\
 10500 \\
 \hline
 110.25 \text{ (putting in the decimals from above)}
 \end{array}$$

Step 6. Since this is quite close, we can leave it as proven (just out of curiosity, 10.4 has a square of 108.16 and 10.6 has a square of 112.36).

So, look for the nearest perfect squares, calculate the number of numbers away for the lower number out of the total difference and then add that decimal to the lower number and check. Leave lots of room and be organized. You have to leave room for your layout and the check below.



lower perfect square

Your number

Higher perfect square

Try to do the following:

$$\sqrt{85}$$

$$\sqrt{30}$$

$$\sqrt{60}$$

In your notebook, find the approximate square root to the nearest tenth for each of the following numbers. Show at least two on this page using the layout shown.

50

90

40

33

136

12

216