

Non-Perfect Squares via Benchmarks

A non-perfect square is when you have a fraction or decimal number when you take a number's square root. They would include all the numbers which we did not consider when making our list of perfect squares.

When we do not have perfect squares, we can estimate what the square root of a number would be.

When we use "benchmarks" we look at which two perfect squares the number falls between, and then see to which it is closer.

Ex. Estimate the square root of 20.

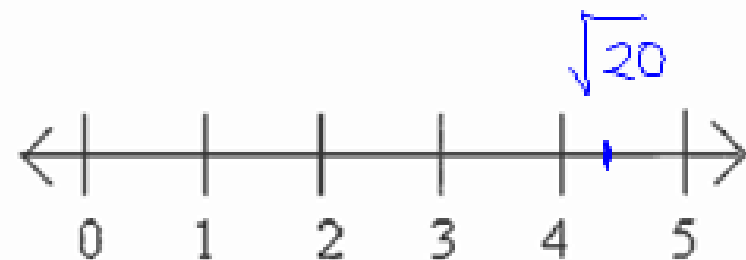
It falls between the perfect squares 16 and 25

It is closer to 16

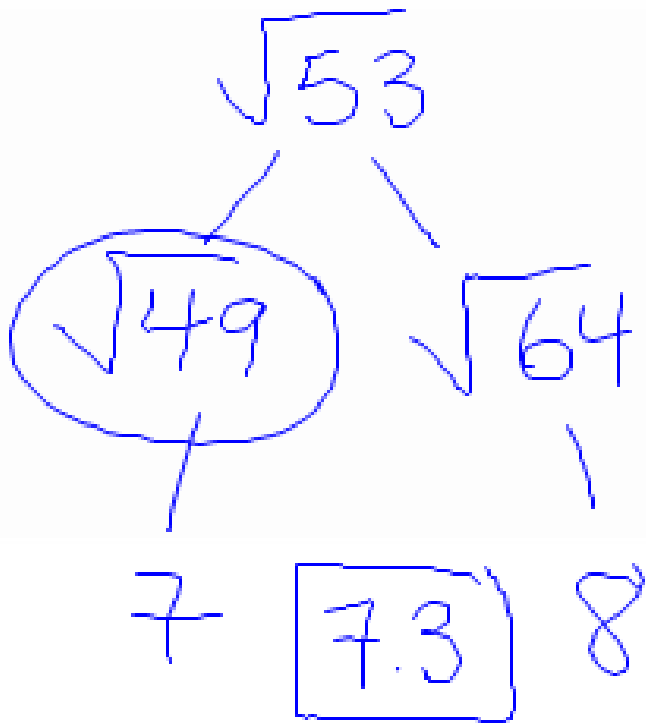
The perfect squares square root is 4 - 5

Therefore I estimate $\sqrt{20}$ to be 4.4

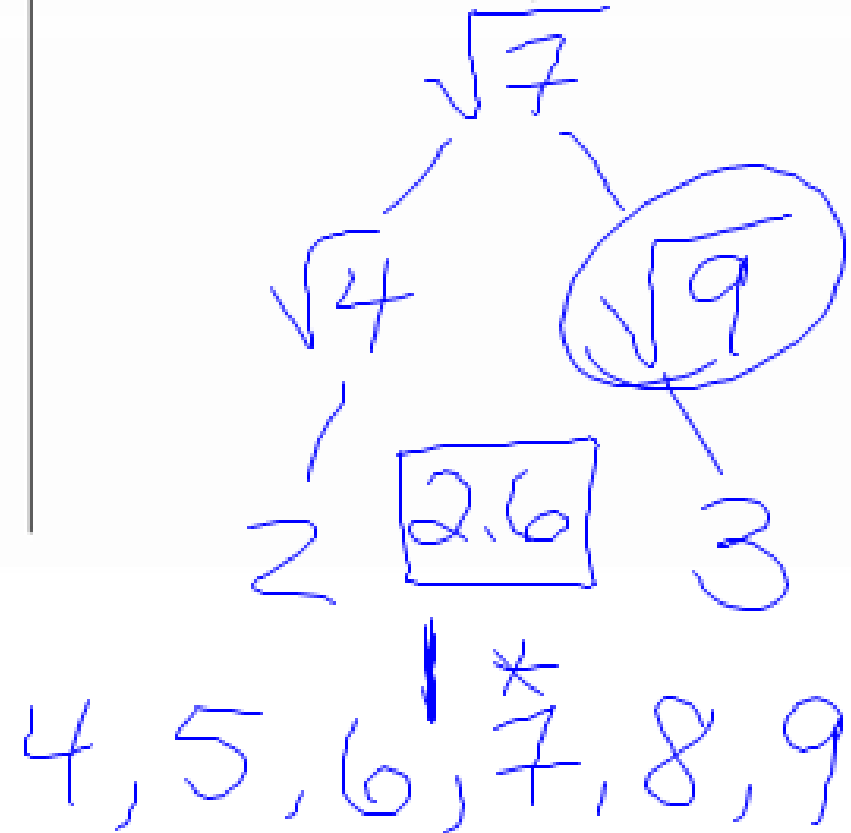
We can visualize this on a number line



Ex2. Estimate the square root of 53



Ex3. Estimate the square root of 7



Estimating the Square Root of a Fraction

Ex. Determine an approximate square root of $\frac{5}{12}$

Which perfect squares are the numbers closest to? 5 4 12 9

So $\frac{5}{12}$ is about equal to which fraction?

$$\sqrt{\frac{4}{9}}$$

And the square root of that fraction is

$$\frac{2}{3}$$

Ex2. Estimate the square root of $\frac{3}{22}$

$$\sqrt{\frac{4}{25}} = \frac{2}{5}$$

Ex3. Estimate the square root of $\frac{18}{6}$

$$\sqrt{\frac{16}{4}} = \frac{4}{2} = 2$$