

Warm Up Grade 8

Thursday, Nov. 14



Find the square of 81

$$81^2 = 6561$$

Find the square root of 121

$$\sqrt{121} = 11$$

Use prime factorization to find (true)
the square root of 4356

$$\begin{array}{c}
 4356 \\
 \swarrow \quad \searrow \\
 2 \quad 2178 \\
 \swarrow \quad \searrow \\
 2 \quad 1089 \\
 \swarrow \quad \searrow \\
 3 \quad 363 \\
 \swarrow \quad \searrow \\
 3 \quad 121 \\
 \swarrow \quad \searrow \\
 11 \quad 11
 \end{array}$$

$$\begin{aligned}
 \sqrt{4356} &= \sqrt{(2 \times 2) \times (3 \times 3) \times (11 \times 11)} \\
 &= \sqrt{2 \times 2} \times \sqrt{3 \times 3} \times \sqrt{11 \times 11} \\
 &= 2 \times 3 \times 11
 \end{aligned}$$

$$\sqrt{4356} = 66$$

HW Solutions

Estimating Square Roots Section 1.4

We have already learned different ways to calculate square roots of perfect square, now we will estimate square roots of any given number.

When **estimating square roots:**

Step 1) you have to find the perfect square before and after the number you are finding the square root of,

Step 2) then determine which perfect square the number is closer to.

This will help you estimate the square root.

Step 3) Make sure it is square root of perfect squares

Perfect Squares	
1	100
4	121
9	144
16	169
25	196
36	225
49	
64	
81	

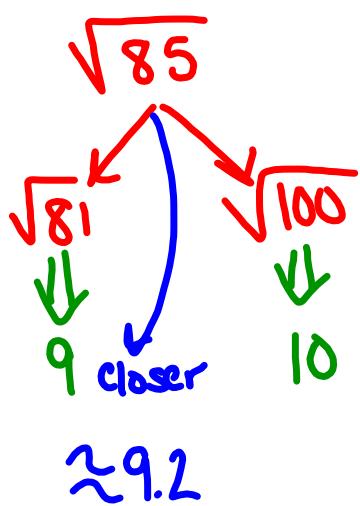


Estimating square roots of non-perfect number.



Estimate the square root of 85.

1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225

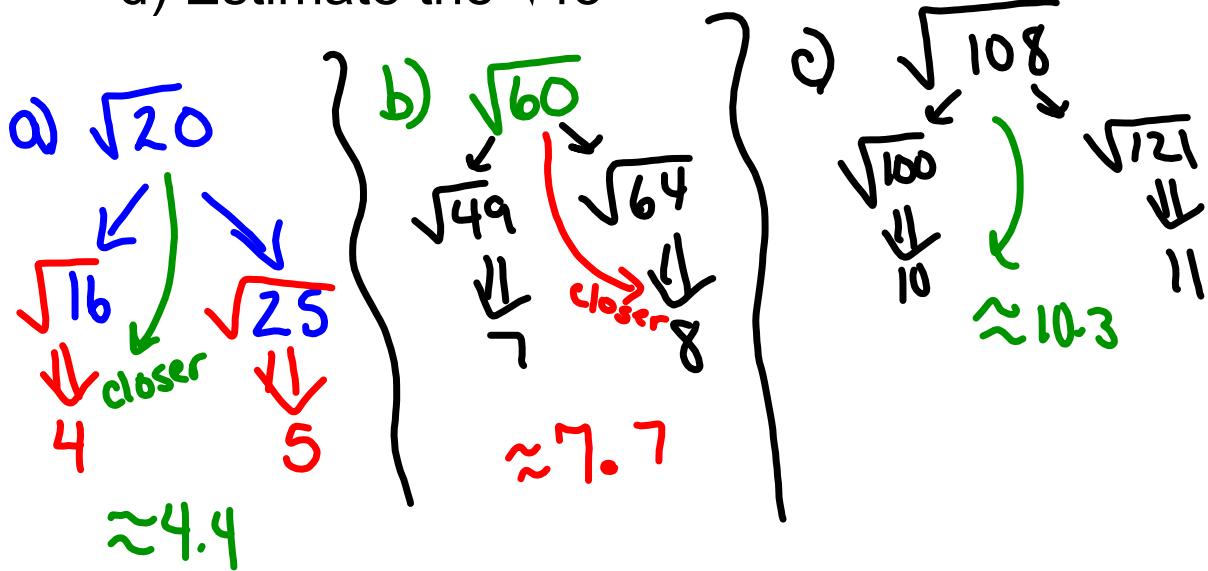


Then estimate the square root of 85

$$\sqrt{85} \approx 9.2$$



- a) Estimate the $\sqrt{20}$
- b) Estimate the $\sqrt{60}$
- c) Estimate the $\sqrt{108}$
- d) Estimate the $\sqrt{45}$



You Try

$$\begin{array}{c} \sqrt{45} \\ \sqrt{36} \quad \sqrt{49} \\ 6 \quad 7 \\ \approx 6.7 \end{array}$$

$$\begin{array}{c} \sqrt{108} \\ \sqrt{100} \quad \sqrt{121} \\ 10 \quad 11 \\ \approx 10.3 \end{array}$$

a) Estimate $\sqrt{20}$

Solutions

$$\begin{array}{ccc} & \sqrt{20} & \\ \sqrt{16} & & \sqrt{25} \\ 4 & & 5 \end{array}$$

so $\sqrt{20}$ must be between
4 and 5
20 is closest in the middle
between 16 and 25
so $\sqrt{20}$ is in the middle between
4 and 5
Est $\sqrt{20} \approx 4.5$

b) $\begin{array}{ccc} \sqrt{60} & & \\ \sqrt{49} & & \sqrt{64} \\ 7 & & 8 \end{array}$

60 is between 49 and 64
so $\sqrt{64}$ is between 7 and 8
60 is closer to 64,
so $\sqrt{60}$ is closer to 8
Est $\sqrt{60} \approx 7.8$

c) $\begin{array}{ccccc} \sqrt{108} & & & \sqrt{108} & \\ \sqrt{100} & \sqrt{121} & \hline & 1 & \sqrt{121} \\ 10 & 11 & & 10.5 & 11 \end{array}$

108 is a little closer to 100
Est $\sqrt{108} \approx 10.4$

d) $\begin{array}{ccc} \sqrt{45} & & \\ \sqrt{36} & & \sqrt{49} \\ 6 & & 7 \end{array}$

Est $\sqrt{45} \approx 6.8$ or 6.9

A square garden has area 150 m².



- a) What are the approximate dimensions of the garden to two decimal places?

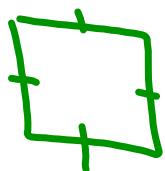
$$\text{Area} = \text{Side}^2$$

$$\text{Side} = \sqrt{\text{Area}}$$

$$\text{Side} = \sqrt{\text{Area}} = \sqrt{150}$$

$$\begin{array}{c} \sqrt{144} \leftarrow \\ 12 \\ \times 12.21 \text{ m} \end{array} \quad \begin{array}{c} \sqrt{169} \leftarrow \\ 13 \end{array}$$

- b) Fencing is needed to keep out the goats. About how much fencing would be needed around the garden?



12.21

$$\text{Perimeter} = 12.21 \times 4 = 48.84 \text{ m}$$

is needed



Homework pg. 25

Quiz Tuesday
Nov 19#~~2~~ #3, #4, #7

$\sqrt{8}$
Estimate

$$\begin{aligned} 4) \quad & \sqrt{15 \times 15} \quad \text{or} \quad \sqrt{225} \\ & = \sqrt{15^2} \cancel{\text{cancel}} \quad = 15 \\ & = 15 \end{aligned}$$

$$\sqrt{15 \times 15} = 15$$

Estimate
 $\sqrt{23}$
 $\sqrt{30}$
 $\sqrt{50}$
 $\sqrt{64} = 8$
 $\sqrt{72}$
 Put in order