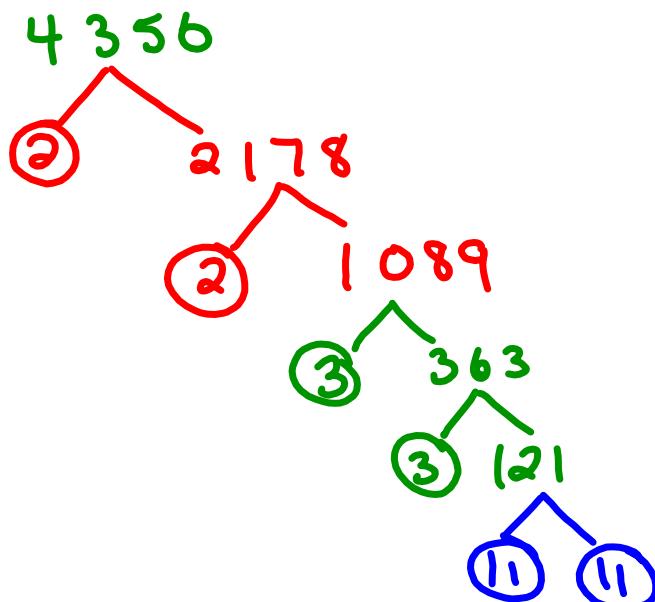


Warm Up Grade 8**Thursday, Nov. 8**

Find the square of 9

$$q^2 = 81$$

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

$$4356 = 2 \times 2 \times 3 \times 3 \times 11 \times 11$$

$$\begin{aligned}
 \sqrt{4356} &= \sqrt{(2 \times 2) \times (3 \times 3) \times (11 \times 11)} \\
 &= \sqrt{2 \times 2} \times \sqrt{3 \times 3} \times \sqrt{11 \times 11} \\
 &= 2 \times 3 \times 11 \\
 &= 66
 \end{aligned}$$

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.

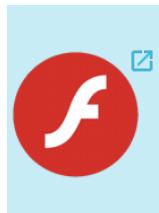
This will help you estimate the square root.

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.



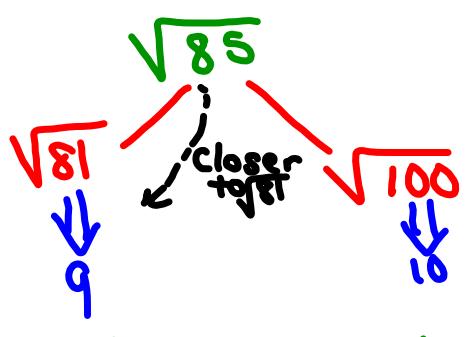
Estimate the square root of 85.

$$1^2 \ 2^2 \ 3^2 \ 4^2 \dots$$

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

\downarrow
85

$$14^2 \ 15^2$$



Then estimate the square root of 85

between 9 and 10
are decimals

≈ 9.2

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

You Try

Show work

- Estimate the $\sqrt{20}$
- Estimate the $\sqrt{60}$
- Estimate the $\sqrt{108}$
- Estimate the $\sqrt{45}$

$$\begin{array}{c} \sqrt{20} \\ \swarrow \quad \searrow \\ \sqrt{16} \quad \sqrt{25} \\ \downarrow \quad \downarrow \\ 4 \quad 5 \end{array}$$

≈ 4.3
 ≈ 4.4

$$\begin{array}{c} \sqrt{60} \\ \swarrow \quad \searrow \\ \sqrt{49} \quad \sqrt{54} \\ \downarrow \quad \downarrow \\ 7 \quad 8 \end{array}$$

≈ 7.9

$$\begin{array}{c} \sqrt{108} \\ \swarrow \quad \searrow \\ \sqrt{100} \quad \sqrt{121} \\ \downarrow \quad \downarrow \\ 10 \quad 11 \end{array}$$

≈ 10.2

$$\begin{array}{c} \sqrt{45} \\ \swarrow \quad \searrow \\ \sqrt{36} \quad \sqrt{49} \\ \downarrow \quad \downarrow \\ 6 \quad 7 \end{array}$$

≈ 6.9

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 $\sqrt{108} \approx 10.4$

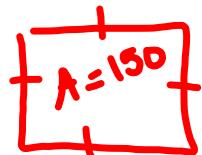
d) $\begin{array}{ccc} \sqrt{45} & & \\ \sqrt{36} & & \sqrt{49} \\ 6 & & 7 \end{array}$

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

A square garden has area 150 m^2 .



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

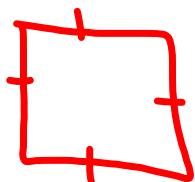


$$\text{Side} = \sqrt{\text{Area}}$$

$$\begin{array}{c} \sqrt{150} \\ \sqrt{144} \quad \sqrt{169} \\ 12 \qquad \qquad 13 \end{array}$$

$$\approx 12.27 \text{ m}$$

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



$$\begin{aligned} \text{Perimeter} &= \underbrace{\text{Side} + \text{Side} + \text{Side} + \text{Side}}_{\text{all same for Square}} \\ &= \end{aligned}$$



$$\approx 4 \times \text{Side}$$

$$\approx 4 \times 12.27 \text{ m}$$

$$\approx 49.08 \text{ m}$$

Homework pg. 25

Quiz Thursday
Nov 15

#2, #3, #4, #7

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