

# Lesson 1.2: Square Roots of Non-Perfect Squares - Worksheet

1. Which numbers below are perfect squares? How do you know?

a)  $\sqrt{\frac{16}{53}}$

NO

b)  $\sqrt{\frac{1}{25}}$

Yes because

$$\frac{1}{5} \times \frac{1}{5} = \frac{1}{25}$$

c)  $\sqrt{0.009}$

NO!

\*Reduce fractions to check for perf. sq\*  
d)  $\sqrt{10.24} = 3.2$

A number is a perfect square if it is the product of a number multiplied by itself.

2. State the benchmark(s) you could use to approximate each square root.

two closet perf. sq's

a)  $\sqrt{29.4}$

b)  $\sqrt{0.41}$

c)  $\sqrt{\frac{18}{37}}$

d)  $\sqrt{\frac{14}{3}} = \sqrt{\frac{16}{4}} = \frac{4}{2} = 2$

$\sqrt{25} = 5$

$\sqrt{36} = 6$

$\sqrt{0.36} = 0.6$

$\sqrt{0.49} = 0.7$

3. Use benchmarks to approximate each square root to the nearest tenth.

a)  $\sqrt{11.6}$

b)  $\sqrt{0.39}$

c)  $\sqrt{\frac{21}{2}} = \sqrt{\frac{25}{1}}$

d)  $\sqrt{\frac{11}{52}} = \sqrt{\frac{9}{49}}$

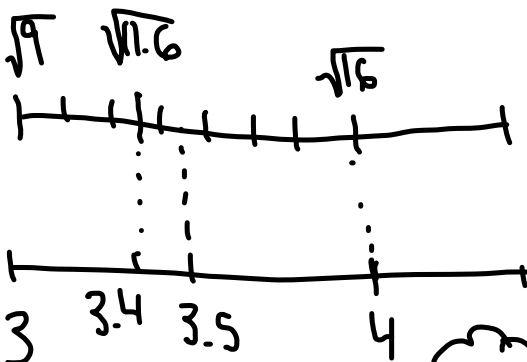
$\sqrt{9} = 3$   $\sqrt{16} = 4$

Since,  $\sqrt{\frac{25}{1}} = \frac{5}{1} = 5$

Then,  $\sqrt{\frac{21}{2}} \approx 5$

Since,  $\sqrt{\frac{9}{49}} = \frac{3}{7}$

Then,  $\sqrt{\frac{11}{52}} \approx \frac{3}{7}$

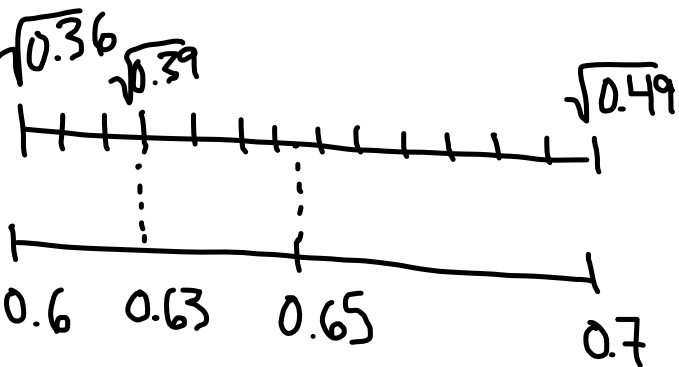


Check:  $(3.4)^2 = 11.6$

$\sqrt{11.6} \approx 3.4$

$$\sqrt{0.39}$$

$$\sqrt{0.36} = 0.6 \quad \sqrt{0.49} = 0.7$$

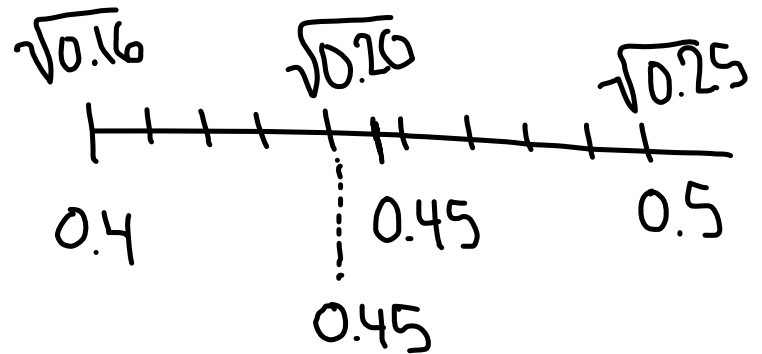


Check:  $(0.63)^2 = 0.3969$

$$\sqrt{0.39} \approx 0.63$$

$$\sqrt{0.20}$$

$$\sqrt{0.16} = 0.4 \quad \sqrt{0.25} = 0.5$$

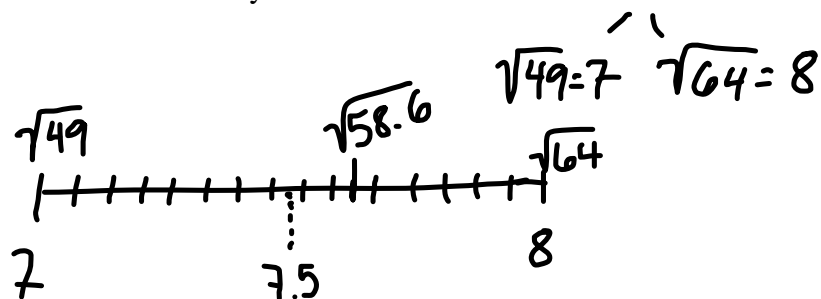


Check:  $(0.44)^2 = 0.1936$

$(0.45)^2 = 0.2025$

$$\sqrt{0.20} \approx 0.45$$

4. Suppose the  $\sqrt{\quad}$  key on your calculator is broken. Explain how you could use your calculator to estimate  $\sqrt{58.6}$  to the nearest tenth.



$\sqrt{58.6}$  is bigger than 7.5  
So, check  $(7.6)^2 = 57.76$   
 $(7.7)^2 = 59.29$

$\therefore \sqrt{58.6} \approx 7.7$

5. Use a calculator to approximate each square root to the nearest tenth.

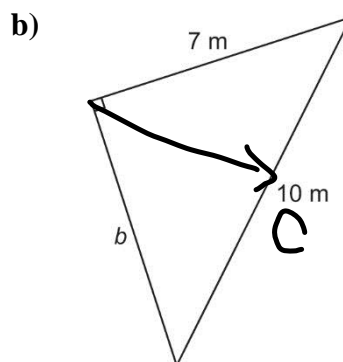
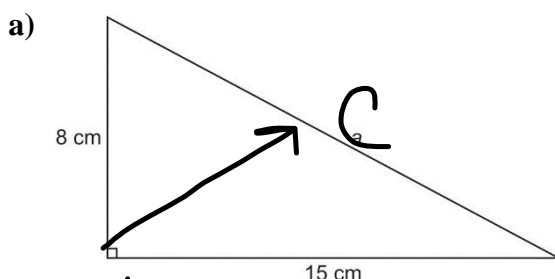
a)  $\sqrt{14.29}$   
 $\approx 3.79$

b)  $\sqrt{\frac{15}{8}}$   
 $= \sqrt{1.875}$   
 $\approx 1.37$

c)  $\sqrt{\frac{2}{19}}$   
 $\approx \sqrt{0.1053}$   
 $\approx 0.32$

d)  $\sqrt{0.7} \approx 0.84$

6. In each triangle, determine the unknown length to the nearest tenth of a unit where necessary.



finding leg:

$$b^2 = c^2 - a^2$$

$$b^2 = 10^2 - 7^2$$

$$b^2 = 100 - 49$$

$$\sqrt{b^2} = \sqrt{51}$$

$b \approx 7.1$

finding hypotenuse:

$$a^2 + b^2 = c^2$$

$$8^2 + 15^2 = c^2$$

$$64 + 225 = c^2$$

$$\sqrt{289} = \sqrt{c^2}$$

$c = 17$