

Determining Square Roots of Rational Numbers Continued

Examples:

You are permitted to use a calculator for all questions.

1. a. $2 - L$ of paint covers an area of 20 m^2 . What is the side length of the largest square area that the paint will cover? Round to the nearest hundredth.

$$A = s^2$$

$$20 = s^2$$

$$\sqrt{20} = \sqrt{s^2}$$

$$4.47 \text{ cm} = s$$

Take the square root of s^2 to solve for s . Whatever you do to one side you have to do to the other.

The square root and square cancel.

- b. What is the side length of the largest square area that a $7.58 - L$ can of the same paint will cover. Round to the nearest hundredth.

$$\frac{2L}{7.58L} = \frac{20\text{m}^2}{x}$$

$$7.58L \quad x$$

$$\frac{2L}{7.58L} \times \frac{20\text{m}^2}{x}$$

$$7.58L \quad x$$

$$2x = 151.6$$

$$\frac{2x}{2} = \frac{151.6}{2}$$

$$x = 75.8$$

Cross Multiply

Cross Multiply

Divide both sides by 2 to solve for x

The 2's cancel.

Solution continued on next slide

$$x = 75.80 \text{ cm}^2$$

$$A = s^2$$

$$75.80 = s^2$$

$$\sqrt{75.80} = \sqrt{s^2}$$

$$8.71 \text{ cm} = s$$

Use this new area to solve for the side length.

Take the square root of s^2 to solve for s . Whatever you do to one side you have to do to the other.

The square root and square cancel.

2. A frame measures 60 cm by 40 cm. Can you mount a square picture with an area of 1000 cm^2 in the frame?

$$A = l \times w$$

$$= 60 \times 40$$

$$= 2400 \text{ cm}^2$$

Find the area of the frame, (rectangle) 1st.

Based on area it seems possible. Check the side length of the square picture to make sure.

$$A = s^2$$

$$1000 = s^2$$

$$\sqrt{1000} = \sqrt{s^2}$$

$$31.6227766 \text{ cm} = s$$

Take the square root of s^2 to solve for s . Whatever you do to one side you have to do to the other.

The square root and square cancel.

It would be possible because both the area of the picture and the side length of the picture is smaller than that of the frame.

3. A rectangular living room is 9.3 m by 5.6 m. A square rug covers $\frac{1}{3}$ of the area of the floor.

What is the side length of the rug, to the nearest tenth of a metre?

$$\begin{aligned}A_{\text{room}} &= l \times w \\ &= 9.3 \times 5.6 \\ &= 52.08 \text{ m}^2\end{aligned}$$

Find the area of the room 1st.

Find the area of the square rug 2nd.

$$\begin{aligned}A_{\text{square}} &= 52.08 \times \frac{1}{3} \\ &= 17.36 \text{ m}^2\end{aligned}$$

$$A = s^2$$

$$17.36 = s^2$$

$$\sqrt{17.36} = \sqrt{s^2}$$

$$4.2 \text{ cm} = s$$

Use this area to determine the side length of the rug.

Take the square root of s^2 to solve for s . Whatever you do to one side you have to do to the other.

The square root and square cancel.