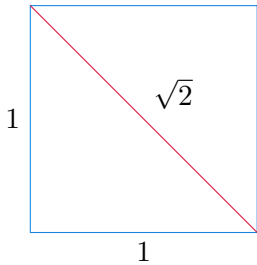


# The Square Root of 2

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$$\sqrt{2} \times \sqrt{2} = 2$$

$$d^2 = \sqrt{l^2 + w^2}$$

$$d^2 = \sqrt{1^2 + 1^2}$$

$$d^2 = \sqrt{2}$$

$$\frac{a}{b}$$

$$\sqrt{2} = \frac{a}{b}$$

$$\Rightarrow 2 = \frac{a^2}{b^2}$$

$$\Rightarrow 2b^2 = a^2$$

$$\Rightarrow 2 \mid a^2$$

$$\Rightarrow 2 \mid a$$

$$2 \mid a$$

$$2 \mid a$$

$$\Rightarrow 4 \mid a^2$$

$$\Rightarrow 4 \mid 2b^2$$

$$\Rightarrow 2 \mid b^2$$

$$\Rightarrow 2 \mid b$$

*A number is rational if and only if its decimal expansion becomes periodic.*