

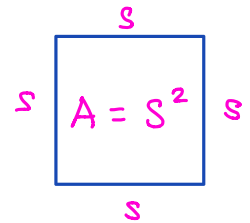
Name: _____

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Learning Goal 7.1 I can identify perfect squares and cubes and evaluate square and cube roots.

What is a **square**? A four sided shape - a quadrilateral - a 2D box.

where all the sides are the same length



A Square Number, or Perfect Square

A number that represents the area of a square with integer side lengths.

What is a **prime factorization**?

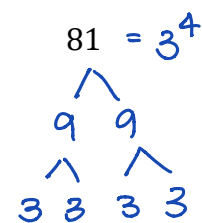
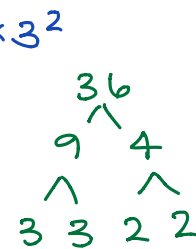
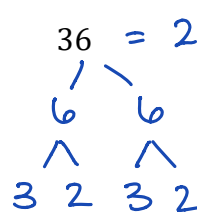
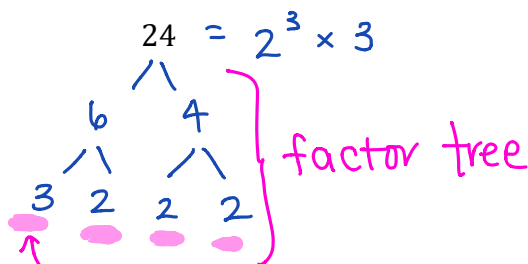
↳ a number with only 2 factors, one and itself.
Break down a composite number into a product of prime numbers.

not a prime, not 1, not 0

Example

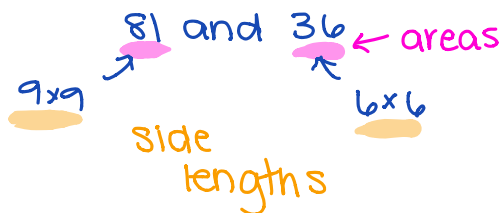
- l x w
- 6 x 4
- 12 x 2
- 3 x 8
- 24 x 1
- 8 x 3
- 4 x 6
- 2 x 12
- 1 x 24

a. Determine the prime factorization of the following numbers:

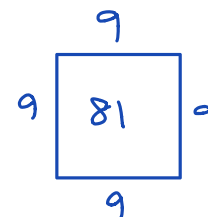
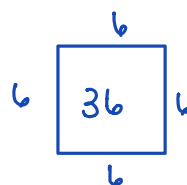


leaf - must be prime in a prime factorization

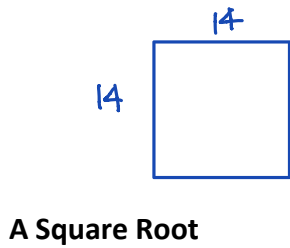
b. Which of these are perfect squares? Explain.



c. For each perfect square, draw the square and label the sides.



Example Determine the area of a square picture with side lengths of 14 cm.



$$A = 14^2 = 196 \text{ cm}^2$$

The area of the picture is 196 cm^2 .

$$\begin{array}{r} 14 \\ \times 14 \\ \hline 56 \\ 140 \\ \hline 196 \end{array}$$

the square root is the opposite operation to squaring a number
 square a number - find the area
 take the square root - find the side length.

Example Use prime factorization to determine $\sqrt{324}$.

$$\sqrt{324} = \sqrt{2^2 \times 3^4} = 2\sqrt{3^4}$$

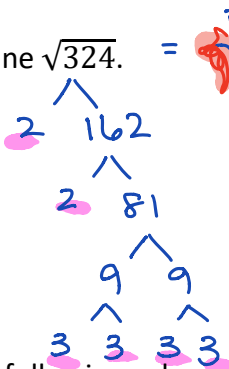
$$= 2\sqrt{3^2 \times 3^2}$$

$$= 2 \times 3 \sqrt{3^2}$$

$$= 2 \times 3 \times 3$$

$$= 18$$

$2^2 \times 5^4$



Example Determine the square roots of the following values.

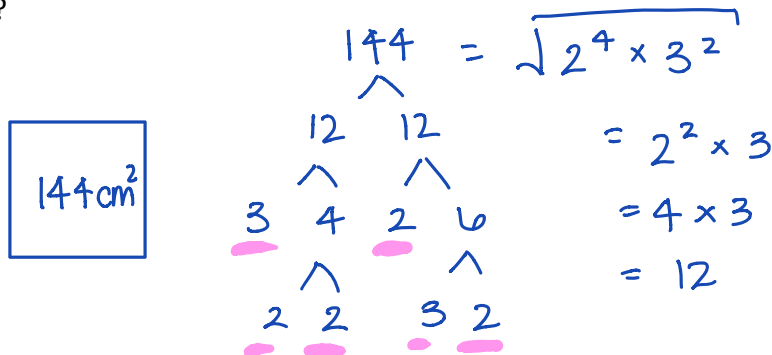
a. $\sqrt{1} = 1$

b. $\sqrt{4} = 2$

c. $\sqrt{49} = 7$

d. $\sqrt{81} = 9$

Example Edgar knows that the square case for his computer game has an area of 144 cm^2 . What is the side length of the case?



The side length of the case is 12 cm.