

# Order of Operations, Perfect Squares, Square Roots

To evaluate mathematical expressions, there must be an order that everyone agrees upon. Thus, we have rules for evaluating expressions called the “order of operations” that mathematicians follow. We will take a look at the rules to find out which operations must be completed first.

Add, subtract, multiply, and divide are basic operations of computation. There is another operation called square root where we find what number times itself is the given number. We'll find perfect squares and then look at how to take the square root of a perfect square.

Order of Operations

Perfect Squares and Square Roots

## Order of Operations

<b>Steps for Order of Operations</b>	<b>1. Do parentheses first.</b>
	<b>2. Working from left to right, do all multiplications and divisions.</b>
	<b>3. Working from left to right, do all additions and subtractions.</b>

**Solve  $3 + 10 \div 2 - 1$**

$$3 + 10 \div 2 - 1 \quad \text{Divide (Step 2)}$$

$$3 + 5 - 1 \quad \text{Add (Step 3)}$$

$$8 - 1 \quad \text{Subtract (Step 3)}$$

**Answer is 7**

**Solve  $25 - 2 \times (3 + 5)$**

$$25 - 2 \times (3 + 5) \quad \text{Parenthesis first (Step 1)}$$

$$25 - 2 \times 8 \quad \text{Multiply (Step 2)}$$

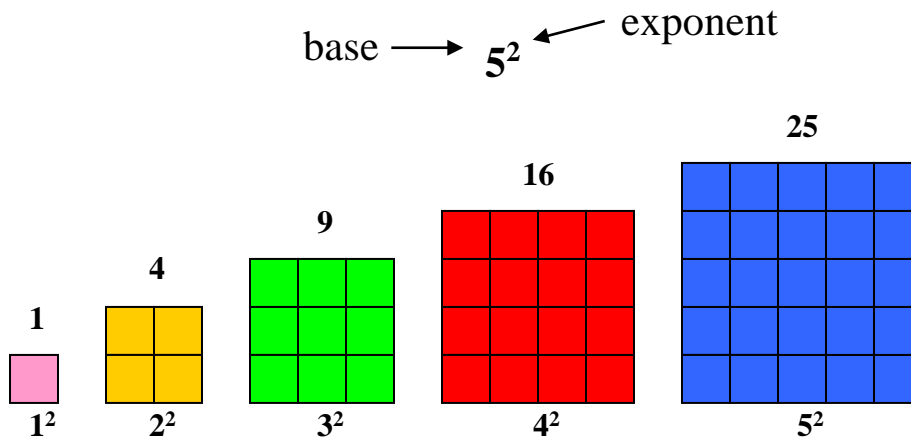
$$25 - 16 \quad \text{Subtract (Step 3)}$$

**Answer is 9**

# Perfect Squares and Square Roots

## Squares

Perfect squares are numbers that are squares of whole numbers.



Whole Number	Perfect Square
$1^2$ (1 squared)	1
$2^2$ (2 squared)	4
$3^2$ (3 squared)	9
$4^2$ (4 squared)	16
$5^2$ (5 squared)	25

## Square Roots

Square roots are numbers that when multiplied by themselves once make perfect squares.

$\sqrt{\quad}$  square root symbol

The **square root of 25 is 5**                      written as                       **$\sqrt{25} = 5$**

The **square root of 49 is 7** because  $7 \times 7$  or  $7^2 = 49$                        **$\sqrt{49} = 7$**