Expressions with Parentheses

Cross-Curricular Focus: Mathematics

Have you ever seen parentheses in a math problem? If you are asked to solve a problem like that, remember the phrase "parentheses first." Parentheses always tell what to do first in a number **expression**. It is important to follow this mathematical rule. You will get a wrong answer if you don't.

The placement of the **parentheses** can change the value of the expression. Let's look at an example. 10 - (4 - 2). If you ignore the parentheses, you might follow the problem from left to right: 10 - 4 = 6 and 6 - 2 = 4. However, by applying the parentheses rule you should instead subtract 2 from 4 as your first step. This will leave you with 10 - 2, which equals 8, not 4.

The parentheses rule is part of a larger set of math rules that mathematicians use. They **decided** to set guidelines to help people all over the world work math problems. Mathematicians now use a common vocabulary when they communicate about math. The parentheses rule is part of the group of rules called the Order of Operations.

Some people use the acronym PEMDAS to help them remember the Order of Operations. PEMDAS stands for the phrase, "**P**lease **E**xcuse **M**y **D**ear **A**unt **S**ally." Each letter also stands for an action in a math expression. The letters tell the order you should take the actions. The **P** is for parentheses. Therefore, operations in parentheses come first. Next, the **E** is for exponents. Exponents are numbers written smaller and up to the right of a regular number. They tell the number of times a number should be multiplied by itself. The **M** and **D** stand for multiply and divide. Whichever of these operations comes first from left to right is done next. Finally, **A** and **S** are for add and subtract. Again, do whichever operation comes first from left to right.

Let's look at how the Order of Operations is applied to this expression: (4 -2) + 3 x 15 - 4 ÷ 2. Parentheses first, so 4 - 2 = 2. That leaves us with 2 + 3 x 15 - 4 ÷ 2. There are no exponents, so multiplication and division are next. We solve 3 x 15 and 4 ÷ 2 before any addition or subtraction: 3 x 15 = 45, and 4 ÷ 2 = 2. Now the expression is 2 + 45 - 2. Addition and subtraction are last from left to right, so 2 + 45 = 47, and 47- 2 = 45.

When you see parentheses in your math problem, they are telling you where to start. Solve what is inside them first. Then you can move on to the other parts using the Order of Operations.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) Why is it important for mathematicians to have certain mathematical rules that they all follow?

_____

_____

2) How do you know what to do first when you look at a math problem?

_____

_____

3) Should you do multiplication or addition first in a math problem?

_____

_____

4) Should you subtract or divide first in a math problem?

_____

_____

5) Is using a memory tool like PEMDAS helpful for you? Why or why not?

_____

_____

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When you see parentheses in your math problem, they are telling you where to start. Solve what is inside them first. Then you can move on to the other parts using the Order of Operations.

Name: _**Key**_

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

Actual wording of answers may vary.

1) Why is it important for mathematicians to have certain mathematical rules that they all follow?
so they can communicate about math with other people around the world.

2) How do you know what to do first when you look at a math problem?
You should use the Order of Operations

3) Should you do multiplication or addition first in a math problem?
multiplication

4) Should you subtract or divide first in a math problem?
divide

5) Is using a memory tool like PEMDAS helpful for you? Why or why not?
student's choice