

A.1 Additional Review

not a real number

Given the following numbers:

$-\frac{5}{11}$ $0.\overline{18}$ $\sqrt{5}$ $-\sqrt{100}$ $\sqrt{100}$ $\sqrt{-100}$ 2.71828 0

List the real numbers? $-\frac{5}{11}, 0.\overline{18}, \sqrt{5}, -\sqrt{100}, \sqrt{100}, 2.71828, 0$

List the irrational numbers? $\sqrt{5}$

List the rational numbers? $-\frac{5}{11}, 0.\overline{18}, -\sqrt{100}, \sqrt{100}, 2.71828, 0$

List the integers? $-\sqrt{100}, \sqrt{100}, 0$

List the whole numbers? $\sqrt{100}, 0$

List the natural numbers? $\sqrt{100}$

Fill in the blanks with the following words:

Addition Subtraction Multiplication Division

addition and multiplication are associative and commutative.

Then provide examples in the following table.

Operation	Associative Property (holds)	Commutative Property (holds)
<i>addition</i>	$(1+2)+3 = 1+(2+3)$	$1+2+3 = 3+2+1$
<i>multiplication</i>	MM $(1 \cdot 2)(3) = 1(2 \cdot 3)$	$2 \cdot 3 = 3 \cdot 2$

subtraction and division are NOT associative and commutative.

Then provide examples in the following table.

Operation	Associative Property <u>DOESN'T HOLD</u>	Commutative Property <u>DOESN'T HOLD</u>
<i>sub.</i>	$(3-2)-1 \neq 3-(2-1)$	$4-2 \neq 2-4$
<i>div</i>	$(8 \div 2) \div 4 \neq 8 \div (2 \div 4)$	$4 \div 2 \neq 2 \div 4$

Write the property that justifies each step in the algebraic proof.

$$9 \left[\left(x + \frac{1}{3} \right) + (-x) \right] \quad \text{Given}$$

$$9 \left[(-x) + \left(x + \frac{1}{3} \right) \right] \quad \text{commutative}$$

$$9 \left[(-x + x) + \frac{1}{3} \right] \quad \text{associative}$$

$$9 \left(0 + \frac{1}{3} \right) \quad \text{additive inverse}$$

$$9 \cdot \frac{1}{3} \quad \text{additive identity}$$

Write an example to help you remember each of the following properties:

Symmetric if $a=b$ then $b=a$

Transitive if $a=b$ and $b=c$ then $a=c$

Commutative switch order of numbers/terms

Associative parentheses

Distributive $a(b+tc) = ab+ac$

Additive Identity adding zero to a number

Multiplicative Identity multiplying a number by 1

Additive Inverse (opposites) $-a+a=0$ adding opposites

Multiplicative Inverse (reciprocals) $a \cdot \frac{1}{a} = 1$ multiplying reciprocals

add/
mult