

Last Name, First Name

Discussion Section

Student ID

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Worksheet 1 • Find The Error

1. Is the following statement true? If a , b , and c are real numbers and a and b are nonzero, then

$$\frac{c}{a} + \frac{c}{b} = \frac{c}{a+b}.$$

2. Is the following statement true? For all x in the real numbers, we have that

$$\sqrt{x^2 + 9} = x + 3.$$

3. Is there anything wrong with the following statement? Since the absolute value of a number x is always positive, we have that

$$\begin{aligned} |x + y|^2 &= |(x + y)^2| \\ &= |x^2 + 2xy + y^2| = x^2 + 2|x||y| + y^2. \end{aligned}$$

4. Is the following statement true? If x is a real number, then

$$\sqrt{9-x}\sqrt{9-x} = 9-x.$$

Under what conditions will the statement be true?

5. Find the error in this argument. If $x = y$, then

$$x^2 = xy.$$

Subtracting y^2 from both sides, we obtain the inequality

$$x^2 - y^2 = xy - y^2.$$

We then write both sides as products, obtaining the equality

$$(x + y)(x - y) = y(x - y).$$

We therefore have that

$$x + y = y.$$

Since $x + y$ is equal to $2y$, we have that

$$2y = y, \quad \text{hence,} \quad 2 = 1.$$

6. Is the following statement true? Suppose that A , B , C , D and E are sets. If $A \cap B$ is a subset of E and if $C \cap D$ is a subset of E , then $(A \cup C) \cap (B \cup D)$ is a subset of E .

7. Construct a statement that appears to be true but is actually false. See if you can, as a group, come up with such a statement, show the statement is false, but convince a neighboring group that your statement is true.