Math-08 Homework #2 Solutions

Reading

- Text book section 0.2.

Problems

1). Let $A = \{x \in \mathbb{R} \mid -1 \leq x \leq 2\}$

   a). Is the statement $\forall\, a \in A, a < 2$ true or false? Why? (Hint: if false, state a counterexample)

   In order for the statement to be true, *all* of the values in A must be < 2. But consider the value $2 \in A$. $2 \not< 2$. so 2 is a counterexample and the statement is false.

   b). Is the statement $\exists\, a \in A, a \leq -1$ true or false? Why?

   In order for the statement to be true, there must be *at least* one (there may be more) value in A that is ≤ -1. Consider $-1 \in A$. $-1 \leq -1$, so there is at least one value and the statement is true.

2). Explain why $\frac{\not{x}+y}{\not{x}} = 1 + y$ is incorrect? What should it equal?

   This is an incorrect application of the definition of division and the distributive law. The correct form is:

$$\frac{x+y}{x} = \frac{1}{x}(x+y) = 1 + \frac{y}{x}$$

3). Let $x = y - 1$. Explain why $y - x = y - y - 1 = -1$ is incorrect? What should it equal?

   This is an incorrect application of the substitution principle. The correct form is:

$$y - x = y - (y - 1) = y - y + 1 = 1$$

4). Type the following equation into your calculator to obtain an answer. You must type it in all at once—not in pieces. Turn in a screenshot showing how you entered it and your answer:

$$\frac{1 - (2 + \frac{3}{2})}{\frac{2}{3} - \frac{4}{5}}$$

   See file on canvas.