

1) Draw a Venn Diagram to illustrate the following situation: (3 points)

“If you play League of Legends, then you use a computer.”



2) Determine whether or not the argument below is valid. (3 points)

“If you play League of Legends, then you use a computer. Alice uses a computer.

Therefore Alice plays League of Legends.”

Based on the Venn Diagram above, we see that Alice could be in either the inner (League of Legends) region, or the middle (Computer but not League of Legends) region. In particular, Alice could use a computer but not play League of Legends, so this argument is not valid.

3) Write the following statement in formal mathematical notation, then determine its truth value. (2+2 points)

“There is a real number  $x$  such that  $3^2 + x^2 = 5^5$ .”

$$\exists x \in \mathbb{R} (3^2 + x^2 = 5^5)$$

This is true, and we can find just such an  $x$ . Namely,  $x = \sqrt{5^5 - 3^2} = \sqrt{3116} \approx 55.8$ .