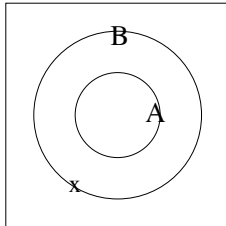


**Homework #3 Solutions**

1. For each of the following arguments, determine if the argument is inductive or deductive.
  - If the argument is inductive, decide whether the argument is strong or weak.
  - If the argument is deductive, determine whether the argument is valid or invalid. If the argument is valid, decide whether the argument is sound or not.

**NOTE:** in all of the Venn diagrams,  $A$  is the set of historical figures that time travel with Bill and Ted,  $B$  is the set of historical figures that love San Dimas, and  $x$  will denote the person in question.

- Premise #1: All of the historical figures that time travel with Bill and Ted love San Dimas.
- (a) Premise #2: Fidel Castro did not time travel with Bill and Ted.  
 Conclusion: Fidel Castro does not love San Dimas.

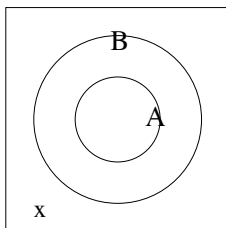


This is a deductive argument because the conclusion is more specific than the premises. It is an invalid argument since the premises only give information about historical figures that do time travel with Bill and Ted. It does not give any information about those who do not.

- (b) Premise #1: All of the historical figures that time travel with Bill and Ted love San Dimas.  
 Conclusion: All historical figures would love San Dimas if they had the chance to go there.

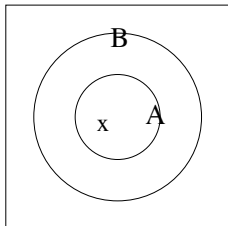
This is an inductive argument because the conclusion is more general than the premise. The argument is a weak one since only a handful of all historical figures time travelled with Bill and Ted.

- Premise #1: All of the historical figures that time travel with Bill and Ted love San Dimas.
- (c) Premise #2: Lawrence of Arabia hates San Dimas.  
 Conclusion: Lawrence of Arabia did not time travel with Bill and Ted.



This is a deductive argument because the conclusion is more specific than the premises. The argument is valid because if the conclusion were false, then Lawrence of Arabia would love San Dimas.

- Premise #1: All of the historical figures that time travel with Bill and Ted love San Dimas.  
 (d) Premise #2: Joan of Arc (aka Maxine of Arc) time travels with Bill and Ted.  
 Conclusion: Joan of Arc loves San Dimas.



This is a deductive argument because the conclusion is more specific than the premises. The argument is valid because Joan of Arc is a member of the set of historical figures that time travel with Bill and Ted which is a subset of the set of historical figures that love San Dimas.

2. Luckily for Bill and Ted, theirs is a deterministic universe, so they are free to time travel all they want without the risk of altering the past, present or future. Needing some new guitars, they travel into the future to find a couple of especially “non-heinous” electric guitars. If the guitars they find cost 8000 universos and \$1 US is worth 14 universos, how much do their guitars cost in US dollars?

$$\left(8000 \text{ universos}\right) \left(\frac{1 \text{ USD}}{14 \text{ universos}}\right) = 571.43 \text{ USD}$$

3. Napoleon, who was an enthusiastic proponent of the metric system, travelled with Bill and Ted to present-day San Dimas. His favorite place in San Dimas, of course, was the water park named Waterloo. If Waterloo uses 110,000 gallons of water per day, how many liters of water does Waterloo go through per year?

( 1 gallon = 3.785 liters, 1 year = 365 days )

$$\left(110,000 \frac{\text{gal}}{\text{day}}\right) \left(\frac{3.785 \text{ L}}{1 \text{ gal}}\right) \left(\frac{365 \text{ days}}{1 \text{ year}}\right) = 151,967,750 \frac{\text{L}}{\text{year}}$$

4. Bill and Ted travel back in time to ancient Egypt. They discover that Queen Hetepheres’ bed was 3.4 royal cubits long. How long is her bed in feet?

( 1 royal cubit = 52.4 centimeters, 1 inch = 2.54 centimeters, 1 foot = 12 inches)

$$\left(3.4 \text{ royal cubits}\right) \left(\frac{52.4 \text{ cm}}{1 \text{ royal cubit}}\right) \left(\frac{1 \text{ in}}{2.54 \text{ cm}}\right) \left(\frac{1 \text{ ft}}{12 \text{ in}}\right) = 5.845 \text{ ft}$$