

Answer the following questions. Explain your reasoning. The following questions are designed to familiarize yourself with the basic definitions of logic. You should form a group and discuss the topics covered thus far.

1. Assume that “Frank is a girl” is a false statement and “Katie is 10 years old” is a true statement. Which of the following is true? Explain.
 - (a) Katie or Frank 10 years old.
 - (b) Either Katie is 10 years old or Frank is a girl.
 - (c) It’s not true that Katie is 10 years old and Frank is a girl.
 - (d) Katie is 10 years old and Frank is not a girl.
 - (e) If Katie is 10 years old, then Frank is a girl.
 - (f) If Frank is a girl, then Katie is 10 years old.
2. Write the negation of each of the following statements:
 - (a) I will go to the beach or the movies.
 - (b) I will stay in my room and do my homework.
 - (c) Pluto is not a planet.
 - (d) $5 \geq 7$
 - (e) $3 < 9$
 - (f) If I study hard, then I will earn an A.
 - (g) All cats are felines.
 - (h) Some dogs are well trained.
 - (i) No dog is afraid of a mouse.
3. Construct a truth table for $(p \vee q) \wedge (\sim p \vee \sim q)$
4. Which of the following is logically equivalent to $\sim p \vee q$? Justify your answer.
 - (a) $\sim p \wedge \sim q$
 - (b) $\sim (p \wedge \sim q)$