

Math 13 - Week 1: Formal Logic

1. What do you think the point of this class is? What do you think we're going to cover? How do you think this class fits into your math education? Do you think you'll enjoy this class?
2. Write the following statement in if-then form: "Every integer divisible by 5 ends in a 0 or a 5 (when written in its usual decimal form)."
3. Write the converse of the statement "If you love me, then you will marry me."
4. Which of the following statements are true and which are false? You don't have to prove your answers (but you should give it a shot!)
 - (a) Every integer is positive or negative.
 - (b) Every integer is even and odd.
 - (c) If x is an integer and $x > 2$ and x is prime, then x is odd.
 - (d) Let x and y be integers. We have $x^2 = y^2$ if and only if $x = y$.
 - (e) The sides of a triangle are all congruent to each other if and only if its three angles are all 60° .
 - (f) If an integer x satisfies $x = x + 1$, then $x = 6$.
5. Are the expressions $x \implies \neg y$ and $\neg(x \implies y)$ logically equivalent?
6. Is the expression $(x \implies y) \vee (x \implies \neg y)$ a tautology (true for all values of x and y)?
7. Can you write $x \implies y$ using only \neg , \vee and \wedge ?