

Math 364 - Chapter 2 HW
Fall 2008

9. (Problem 2.1) Determine which of the following sentences are mathematical statements, and explain why:
- (a) My e-mail password is “swordfish.”
 - (b) I don’t understand.
 - (c) Are you really taking that math? Are you crazy?
 - (d) This sentence is false.
 - (e) $310 \div 0 = 31$
 - (f) I prefer pi.
 - (g) If you become a mathematics major, then you’ll land a high-paying job.
10. (Problem 2.2) Produce as many grammatically correct versions as you can for the negation of each statement:
- (a) The number x is negative.
 - (b) For all x , $f(x), 0$.
 - (c) There exists an x such that $g'(x)$ is undefined.
11. (Problem 2.3) Express the statement “Not (A and B)” as an equivalent statement involving only “not” and “or.” Then express the statement “not (A or B)” as an equivalent statement involving only “not” and “and.” justify your answers with truth tables.
12. (Problem 2.4) Which of the following implications is true and why:
- (a) If $1 + 1 = 3$, then $\sqrt{36} = -6$.
 - (b) If $\cos \pi = 0$ then $\sin \pi = 0$.
 - (c) If $\sin \pi = 0$ then $\cos \pi = 0$.
 - (d) If $x = -3$ satisfies $x^2 = 9$ then $\log_2 \frac{1}{8} = -3$.
13. (Problem 2.5) Consider an implication, its converse, its inverse, and its contrapositive. Which of these statements are equivalent to one another? Justify your answers with truth tables.