Jennifer Cafiero

I pledge my honor that I have abided by the Stevens Honor System

CS 135 Homework 3

Section 1.6

4.
   a. Simplification
   b. Disjunctive Syllogism
   c. Modus Ponens
   d. Addition
   e. Hypothetical Syllogism

Section 1.7

6. Assume m and n are odd numbers. The definition of the odd integers are m = 2k + 1 and n = 2r + 1. To show that m * n is also odd, we can set m * n equal to (2k + 1) * (2r + 1). m * n = (2k + 1) (2r +1) = 4kr + 2k + 2r + 1. We can define m * n as an odd integer because it is one more than twice our two integers plus 4*k*r (which is also even). This proves m * n is odd.

18.
   a. Assume 3n + 2 is an even integer and n is also an even integer. Substitute every n with "2k + 1" which is an odd integer.
      3(2k + 1) + 2 = 2k + 1 6k + 3 + 2 = 2k + 1   6k +5 = 2k + 1
      Both sides of the equation are odd, helping prove the contraposition correct.

Section 1.8

3. Case(i) : when x ≥ y, max(x, y) is x and min(x, y) is y, so with substitution "max(x, y) + min(x, y) = x + y" becomes x + y = x +y
   Case(ii) : when x < y, max(x, y) is y and min(x, y) is x, so with substitution "max(x, y) + min(x, y) = x + y" becomes y + x = x +y. Using the commutative property, this becomes x + y = x + y

11.

Statement	Reason
m^3 is an integer	Given
n^2 is an integer	Given
m = 2 and n =3	Assignment by example
2^3 = 8	Math
3^2 = 9	Math
8 and 9 are consecutive integers	Given

Section 2.1

1.
    a. {0, 1}
    b. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11}
    c. {1, 4, 9, 16, 25, 36, 49, 64, 81}
    d. { }
2.
    a. { x | x is a real number that is a factor of 3 between 0 and 12, inclusive }
    b. { x | x is an integer that is between -3 and 3, inclusive }

6. B is a subset of A. C is a subset of A and D.

21.
    a. { { }, {a} }
    b. { { }, {a}, {b}, {a, b} }

27. A x B
    a. { (a, y), (b, y), (c, y), (d, y), (a, z), (b, z), (c,z), (d,z) }

Section 2.2

3.
    a. {0, 1, 2, 3, 4, 5, 6}
    b. {3}
    c. {1, 2, 4, 5}
    d. {0, 6}