Problem 10

Base Case: For any value of x, if y == 0, then return 0. Hence, multiply(x,0) = 0

Inductive Hypothesis: For all integers x , y and there exist a k such that k = |y| then

multiply(x, y) = x\*y

Induction Step: showing if it holds for (x, y+1) and that multiply(x, y+1) = x(y+1)

multiply(x, y+1) = multiply

*From inductive hypothesis,* multiply

=

Hence, proved that multiply(x,y) = x\*y

b) In the worst case, the line 5 will be executed until y is not down to 0 which will take O() steps