Module 1 Creativity Exercises

1.6.39)

Base case: T(0) = 2^0, n= 0

1 = 2^0 so 1 = 1, true

Induction Hypothesis: assume T(n) = 2^n for all values of n >= 1

Induction Step: show T(n+1) = 2 ^ n + 1

T(n+1) = 2T(n+1-1)

= 2T(n)

= 2 * 2^n

= 2 ^ n + 1

Which proves the case for n+ 1

1.6.42)

$\sum_{i=1}^{n} i^2$ <= $\sum_{i=1}^{n} n^2$

= $n^2 \sum_{i=1}^{n} 1$

= n^3 since $\sum_{i=1}^{n} 1$ = n