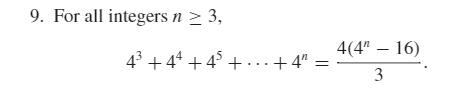
**Assignment 5 – Part 1  
p286 Set 5.2: 9, 27, 35 , Set 5.3 : 10, 18, 23.b**



**9.) Let be   
[We must show that is true for all integers .  
Show that P(3) is true:  
Hence is true.  
Show that for all integers , if is true then is also true:  
Suppose that is true for a particular but arbitrarily chosen integer   
That is, suppose that  
[We must show that is true. That is:]  
[We will show that the left-hand side of equals the right-hand side.]which is the right-hand side of [as was to be shown.]**



**27.)**

**35.) The problem with this proof is that “starting from a statement and deducing a true conclusion does not prove that the statement is true. A true conclusion can also be deduced from a false statement.”[Taken from textbook]**

**Set 5.3 : 10, 18, 23.b**



**10.) Let is divisible by 3, for each integer   
Base case   
 which is divisible by 3.  
Therefore, is true.  
Suppose that is true for any particular but arbitrarily chosen integer   
 is divisible by 3.  
By definition of divisibility, this means that  
for some integer .  
[We must show that is also divisible by 3.]  
 is divisible by 3  
By algebra  
By substitution:**

**Thus, we have proved that is divisible by 3. Since we have proved the basis step and the inductive step, we conclude that the proposition is true.**



**18.) Let , for all integers   
Base Case Therefore, is true.  
Suppose that is true for any particular but arbitrarily chosen integer   
[We must show that is also true.]  
By substitution:  
Thus, we have proven that is true. Since we have proved the basis step and the inductive step, we conclude that the proposition is true.**



**23.b.) Let for all integers   
Base Case   
Therefore, is true.  
Suppose that is true for any particular but arbitrarily chosen integer   
[We must show that is also true.]  
 Dividing both sides by k+1 does not change inequality sign because   
If then is certainly greater than   
Thus, we have proven that is true. Since we have proved the basis step and the inductive step, we conclude that the proposition is true.**