

OIL CONSERVATION COMMISSION

P. O. BOX 2045

HOBBS, NEW MEXICO

Date March 6, 1956

TO:

Gulf Coast Western Oil Co.

916 Pet. Bldg.

Okla. City, Okla.

Gentlemen:

In accordance with the provisions of Commission Order No. R-767,  
your Cook Glier 3B 33-22-37,  
Lease and Well No. S-T-R,  
which is producing from the Green formation, has been  
placed in the Langlie Mattix Pool, and from this date forward  
will be subject to the Commission's rules and regulations governing  
that pool.

You are hereby instructed to file Form C-110 in quintuplicate with  
the Hobbs office showing the change in pool designation.

All future Commission reports for this well must be filed under  
the name of the pool in which it is now located.

OIL CONSERVATION COMMISSION

*A. E. Porter, Jr.*  
A. E. Porter, Jr.  
Proration Manager

cc: CCC, Santa Fe  
Transporter- Shell Pipe Line Corp.

## Mathematical Induction

Proposition 1.1

$$1 + 2 + \dots + n = \frac{n(n+1)}{2}$$

Proof. We use mathematical induction.

Base case:  $n=1$ .  
Left side:  $1$ .  
Right side:  $\frac{1(1+1)}{2} = 1$ .  
So the formula holds for  $n=1$ .  
Inductive step: Assume the formula holds for  $n=k$ .  
We need to show it holds for  $n=k+1$ .  
Left side:  $1 + 2 + \dots + k + (k+1)$ .  
Right side:  $\frac{(k+1)(k+1+1)}{2} = \frac{(k+1)(k+2)}{2}$ .

Conclusion:

The formula  $1 + 2 + \dots + n = \frac{n(n+1)}{2}$  holds for all  $n \in \mathbb{N}$ .

Proposition 1.2: For all  $n \in \mathbb{N}$ ,  $1^2 + 2^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$ .

Proof. We use mathematical induction.

Base case:  $n=1$ .  
Left side:  $1^2 = 1$ .  
Right side:  $\frac{1(1+1)(2 \cdot 1 + 1)}{6} = \frac{1 \cdot 2 \cdot 3}{6} = 1$ .

Inductive step: Assume the formula holds for  $n=k$ .  
We need to show it holds for  $n=k+1$ .

Left side:  $1^2 + 2^2 + \dots + k^2 + (k+1)^2$ .  
Right side:  $\frac{(k+1)(k+1+1)(2(k+1)+1)}{6} = \frac{(k+1)(k+2)(2k+3)}{6}$ .

Conclusion: The formula  $1^2 + 2^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$  holds for all  $n \in \mathbb{N}$ .

Proposition 1.3: For all  $n \in \mathbb{N}$ ,  $1^3 + 2^3 + \dots + n^3 = \left(\frac{n(n+1)}{2}\right)^2$ .

Proof. We use mathematical induction.

Base case:  $n=1$ .  
Left side:  $1^3 = 1$ .  
Right side:  $\left(\frac{1(1+1)}{2}\right)^2 = 1$ .

Inductive step: Assume the formula holds for  $n=k$ .  
We need to show it holds for  $n=k+1$ .

Left side:  $1^3 + 2^3 + \dots + k^3 + (k+1)^3$ .  
Right side:  $\left(\frac{(k+1)(k+1+1)}{2}\right)^2 = \left(\frac{(k+1)(k+2)}{2}\right)^2$ .

Conclusion:

The formula  $1^3 + 2^3 + \dots + n^3 = \left(\frac{n(n+1)}{2}\right)^2$  holds for all  $n \in \mathbb{N}$ .