We discussed recent updates to the web page.

In §11.2: p. 835 - Alternate, sometimes useful formula for $S_n$. (for AS).

$$S_n = \frac{n}{2} \left[ 2a + (n-1)d \right] \quad \text{(known)}$$

\[= \frac{n}{2} \left[ a + a + (n-1)d \right] \]
\[= \frac{n}{2} \left[ a + (a+(n-1)d) \right] \]
\[= \frac{n}{2} \left[ a_1 + a_n \right] \]

\[S_n = \frac{n}{2} (a_1 + a_n) \]
\[S_n = \frac{n}{2} (a_1 + a_n) \]
\[S_n = n \left( \frac{a_1 + a_n}{2} \right) \]

Remember: for AS.

"a and d" \[\Rightarrow a_n = a + (n-1)d \quad \text{\&} \quad S_n = \frac{n}{2} \left[ 2a + (n-1)d \right] \]


**Solu**

$a = ?, n=20, d=3$
2. Find \( a \). 
\[
101 = a_{20} = a + 19 \cdot 3
\]
\[
101 = a + 57 \Rightarrow a = 44
\]

3. \( a_n = a + (n-1)d \)

\[
\boxed{a_n = 44 + (n-1)3}
\]

\[
= 44 + 3n - 3 = 41 + 3n
\]

\[
\boxed{a_n = 41 + 3n}
\]

\[\Box\]

Example §11.2: p. 838: #58.

Telephone poles in a pile

Layer 1: 25 poles

" 2: 24 " and so on.

If there are 12 layers, how many poles in the pile?

\[\text{Sol} n \]

1. 25, 24, 23, 22, ...

\[\text{Ah HA - } (\text{AS})\]

2. \( a = 25 \), \( n = 12 \), \( d = -1 \)

3. \[
S_n = \frac{n}{2} \left[ 2a + (n-1)d \right]
\]

\[
S_{12} = 6 \left[ 2 \cdot 25 + 11 \cdot (-1) \right]
\]

\[
= 6 \left[ 50 - 11 \right] = 6 \left[ 39 \right] = 234
\]

4. There are 234 poles in the pile.
§ 11.3 Geometric Sequences, p. 838.

A. \[ a_1 = a \]
\[ a_2 = ar \]
\[ a_3 = (ar)r = ar^2 \]
\[ a_4 = ar^3 \]
\[ a_5 = ar^4 \]
\[ a_6 = ar^5 \]
\[ a_7 = ar^6 \]
\[ a_n = ar^{n-1} \]

The \( n \)-th term of a GS.

B. The \( n \)-th partial sum of a GS is
\[ S_n = a \left[ \frac{1-r^n}{1-r} \right] = \frac{a(1-r^n)}{(1-r)} \]

C. "r, a, n"
These are the 3 important items that you need to know in order to use either of the two formulas listed above.