

Quiz Notes

explicit formulas

geometric: $u_n = u_1 (\text{rule})^{n-1}$ (multiply)

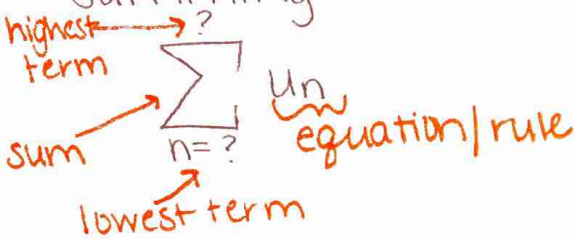
arithmetic: $u_n = n(\text{c.d.}) + u_0$ (add/subtract)

ex 1 4, 9, 14 ...
 $u_1 = 4$ c.d. = 5
 $u_n = 5n - 1$

ex 2 9, 3, 1, 1/3, 1/9 ...
 $u_1 = 9$ $r = 1/3$
 $u_n = 9(1/3)^{n-1}$

sigma notation

• summing terms in a sequence



ex expand & evaluate

$\sum_{n=2}^8 n^2 = 2^2 + 3^2 + 4^2 + 5^2 + 6^2 + 7^2 + 8^2 = 203$
 expand evaluate

ex 2 write using sigma notation

a) $\frac{1}{5} + \frac{1}{6} + \frac{1}{7} + \frac{1}{8}$ (pattern)
 $\sum_{n=5}^8 \frac{1}{n}$

b) $3 + 12 + 48 \dots + u_{15}$ (arithmetic & geometric)
 1st make explicit formula: $u_n = 3(4)^{n-1}$
 $u_{15} \rightarrow \sum_{n=1}^{15} 3(4)^{n-1}$
 list $\rightarrow n=1$ always begins w/ $n=1$

Sum Equations

① arithmetic sum

$$S_n = \frac{n(u_1 + u_n)}{2}$$

- $n \rightarrow$ number of terms
- $u_1 \rightarrow$ 1st term
- $u_n \rightarrow$ last term
- * all n's are the same #

② geometric sum

$$S_n = \frac{u_1(1-r^n)}{1-r}$$

- $n \rightarrow$ # of terms
- $u_1 \rightarrow$ 1st term
- $r \rightarrow$ rule/ratio
- * all n's are the same #

③ infinite geometric sum

$$S_{\infty} = \frac{u_1}{1-r}$$

- $u_1 \rightarrow$ 1st term
- $r \rightarrow$ rule/ratio

- * only works when...
- 1. geometric
- 2. $n = \infty$
- 3. $r < 1$

Word problems

- you need to figure out if it's geometric or arithmetic
- write the equation for the explicit formula 1st.

*remember you will be given the sum equations, unlabeled.