Arithmetic Series – Given an arithmetic seq. with a common difference, d, partial sum S_n can be found by...

(1) $S_n = \frac{n}{2}\left[2a_1 + (n-1)d\right]$.

or

(2) $S_n = n\left(\frac{a_1 + a_n}{2}\right)$.

(*) Infinite arithmetic sequences do not have a sum.

$\Updownarrow$

(*) Infinite Arithmetic sequences are **always** divergent.

1a) S_{14} of $3+7+11+15+\dots$

$a_n = 4n-1$ $\quad a_{14} = 4(14)-1 = 55$

$$S_n = \frac{n}{2}[2a_1 + (n-1)d]$$

$$S_{14} = \frac{14}{2}[2(3) + (14-1)4]$$

$$= 7[6 + (13)4]$$

$$= \boxed{406}$$

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

$$= \cancel{14}^{7}\left(\frac{3+55}{\cancel{2}}\right)$$

$$= \boxed{406}$$

2a) $6+13+20+\cdots+69$

$a_n = 7n-1$

$69 = 7n-1$

$10 = n$

$\frac{a_n - a_1}{d} + 1$

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

$S_{10} = 10\left(\frac{6+69}{2}\right) = \cancel{10}^{5}\left(\frac{75}{\cancel{2}_{1}}\right)$

$= 375$

Hello

ello