C11 - 1.2 - Arithmetic Series Notes

2,5,8 ... $s_{12} = ?$

$s_n = sum\ of\ n\ terms$

+3 +3

2, 5, 8, ?, ... ?

t_1 t_2 t_3 t_4 t_{12}

$n = 1$ $n = 2$ $n = 3$ $n = 4$ $n = 12$

$t_1 = 2$

$d = t_n - t_{n-1}$ $d = t_n - t_{n-1}$

$d = 8 - 5$ $d = 5 - 2$

$d = 3$ $d = 3$

What is the sum of the first twelve terms s_{12}? $s_{12} = ?, n = 12$.

$s_n = \frac{n}{2}(2t_1 + (n-1)d)$

$s_{12} = \frac{12}{2}(2(2) + (12-1)3)$

$s_{12} = 6(4 + (11)3)$

$s_{12} = 6(4 + 33)$

$s_{12} = 6(37)$

$s_{12} = 222$

$s_n = \frac{n}{2}(2t_1 + (n-1)d)$

Sum of "n" terms formula: if t_n is not known.

Check your answer:

$2 + 5 + 8 + 11 + 14 + 17 + 20 + 23 + 26 + 29 + 32 + 35 = 222$ ✓

OR

$s_n = \frac{n}{2}(t_1 + t_n)$

$s_{12} = \frac{12}{2}(2 + t_{12})$

$s_{12} = 6(2 + 35)$

$s_{12} = 222$

$t_n = 3n - 1$

$t_{12} = 3(12) - 1$

$t_{12} = 35$

$s_n = \frac{n}{2}(t_1 + t_n)$

Sum of "n" terms formula: if t_n is known.