Name Schlansky
Mr. Schlansky

Date _____
Algebra II

Finding the Sum of an Arithmetic Series (Explicit Notation)

1. Find the sum of the first 8 terms of the sequence 3 + 5 + 7 + 9 + …

+2 +2 +2

$S_n = \frac{n(a_1+a_n)}{2}$ $a_1 = 3$, $d = 2$, $n = 8$, $a_n = 17$

$S_8 = \frac{8(3+17)}{2}$

$S_8 = 80$

$a_n = a_1 + d(n-1)$ $a_1 = 3$, $d = 2$, $n = 8$

$a_8 = 3 + 2(8-1)$

$a_8 = 17$

+3 +3 +3

2. Find the sum of the first 20 terms of the sequence 4 + 7 + 10 + 13 + …

$S_n = \frac{n(a_1+a_n)}{2}$ $a_1 = 4$, $d = 3$, $n = 20$, $a_n = 61$

$S_{20} = \frac{20(4+61)}{2}$

$S_{20} = 650$

$a_n = a_1 + d(n-1)$ $a_1 = 4$, $d = 3$, $n = 20$

$a_{20} = 4 + 3(20-1)$

$a_{20} = 61$

+5 +5 +5

3. Find the sum of the first 15 terms of the sequence 9 + 14 + 19 + 24 + …

$S_n = \frac{n(a_1+a_n)}{2}$ $a_1 = 9$, $d = 5$, $n = 15$, $a_n = 79$

$S_{15} = \frac{15(9+79)}{2}$

$S_{15} = 660$

$a_n = a_1 + d(n-1)$ $a_1 = 9$, $d = 5$, $n = 15$

$a_{15} = 9 + 5(15-1)$

$a_{15} = 79$

-3 -3 -3

4. Find the sum of the first 12 terms of the sequence 14 + 11 + 8 +5 + …

$S_n = \frac{n(a_1+a_n)}{2}$ $a_1 = 14$, $d = -3$, $n = 12$, $a_n = -19$

$S_{12} = \frac{12(14+-19)}{2}$

$S_{12} = -30$

$a_n = a_1 + d(n-1)$ $a_1 = 14$, $d = -3$, $n = 12$

$a_{12} = 14 - 3(12-1)$

$a_{12} = -19$

+9 +9 +9

5. Find the sum of the first 67 terms of the sequence 2 + 11 + 20 +29 + …

$S_n = \frac{n(a_1+a_n)}{2}$ $a_1 = 2$ $d = 9$ $n = 67$ $a_n = 596$

$S_{67} = \frac{67(2+596)}{2}$

$S_{67} = 20033$

$a_n = a_1 + d(n-1)$

$a_{67} = 2 + 9(67-1)$

$a_{67} = 596$

$a_1 = 2$ $d = 9$ $n = 67$

-5 -5 -5

6. Find the sum of the first 18 terms of the sequence 100 + 95 + 90 + 85 + …

$S_n = \frac{n(a_1+a_n)}{2}$ $a_1 = 100$ $d = -5$ $n = 18$ $a_n = 15$

$S_{18} = \frac{18(100+15)}{2}$

$S_{18} = 1035$

$a_n = a_1 + d(n-1)$

$a_{18} = 100 - 5(18-1)$

$a_{18} = 15$

$a_1 = 100$ $d = -5$ $n = 18$

+3 +3 +3

7. Find the sum of the first 10 terms of the sequence -12 - 9 - 6 - 3 - …

$S_n = \frac{n(a_1+a_n)}{2}$ $a_1 = -12$ $d = 3$ $n = 10$ $a_n = 15$

$S_{10} = \frac{10(-12+15)}{2}$

$S_{10} = 15$

$a_n = a_1 + d(n-1)$

$a_n = -12 + 3(10-1)$

$a_n = 15$

$a_1 = -12$ $d = 3$ $n = 10$

-4 -4 -4

8. Find the sum of the first 25 terms of the sequence 6 + 2 - 2 – 6 - 10 - …

$S_n = \frac{n(a_1+a_n)}{2}$ $a_1 = 6$ $d = -4$ $n = 25$ $a_n = -90$

$S_{25} = \frac{25(6-90)}{2}$

$S_{25} = -1050$

$a_n = a_1 + d(n-1)$

$a_{25} = 6 - 4(25-1)$

$a_{25} = -90$

$a_1 = 6$ $d = -4$ $n = 25$