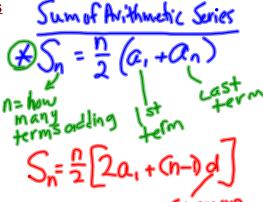
11-2 Arithmetic Series

Objective: Find sums of arithmetic series. Use sigma notation.

Series: An indicated sum of the terms of a sequence.

4 = 4 18, 22, 26, 30-Arithmetic sequence.

18+22+26+30-arithmetc series.



EX 1. Find the sum of the first 20 even numbers, beginning with 2.

$$S_n = \frac{n}{\lambda} (\alpha_1 + \alpha_n)$$

$$5_{20} = \frac{20}{20}(3 + 40) = 10(42)$$

EX 2. Find the sum of the first 100 positive integers.

$$S_n = \frac{n}{2}(\alpha_1 + \alpha_n)$$

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$$S_{100} = \frac{160}{2}(1 + 100)$$

$$= 50(101) = 50$$

EX 3. A radio station considered giving away \$4000 everyday in August, which would equal \$124,000. But they decided to increase the amount given everyday, but give the same total. They want to increase \$100 a day, so how much should they give away the

First day? We need
$$Q_1$$
. $N=31$

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

$$124_1000 = \frac{31}{2} \left[2a_1 + (31-1)\cos \right]$$

$$124_1000 = \frac{15}{5} \left[2a_1 + 3000 \right]$$

= 124,000,0=100

EX 4. Find the first 4 terms of the arithmetic sequence in which $a_1=14$, $a_n=29$, $S_n=129$.

We need "d"

$$3 = 0.1+(n-1)d$$

$$29 = 14+(6-1)d$$

$$15 = 5d$$

$$3 = d$$

$$S_{n} = \frac{n}{2}(a_{1} + a_{n})$$

$$|29 = \frac{n}{2}(|4 + 29)$$

$$|29 = \frac{n}{2} \cdot |43$$

$$|29 = \frac{n}{2} \cdot |43$$

$$|3 = \frac{n}{2} \cdot |43$$

$$|3 = \frac{n}{2} \cdot |6 = n$$

Sigma Notation-shortens writing out series. upper limit Summation Notation **S** formula Ex 5. 3+6+9+12+...+30. lower limit Need formula $Q_n = Q_1 + (n-1)d$ $Q_n = 3 + (n-1)3 = 3 + 3n - 3$ =Bn-formula EX 6. Evaluate $\Sigma^{(2k+1)} = (2.3+1) + (2.4+1) + (2.5+1) + (2.6+1)$ k=3 + (27+1)+(2.8+1)+(2.9+1)+(2.10+1) = 7+9+11+13+15+17+19+21 EX 7. 8 \sum (3j-4) 3.5-4=11=0, 3.8-4=20=0, $S_n = \frac{n}{3}(\alpha_1 + \alpha_n)$ Ex 8. 6 + 13 + 20 + 27+ ... + 97 5 = = 2 (a1+an) S14= 14 (6+97)= ⁻³7(103)=(72 We need "n" an=a,+(n-1)d 97=6+(n-i)7 97=6+71-7 97=7n-1 98=79