Bell Work: ~~24~~ 270, ~~100~~,

The first four rows of chairs are set up for a meeting. The seating pattern starts with 4 chairs in the first row, and adds 1 chair to each row through 20 rows. How many chairs will there be in all 20 rows?

1 - 4 - 4
2 - 5 - 9
3 - 6 - 15
4 - 7 - 22
5 - 8 - 30
6 - 9 - 39
7 - 10 - 49
8 - 11 - 60
9 - 12 - 72
10 - 13 - 85
11 - 14 - 99
12 - 15 - 114
13 - 16 - 130
14 - 17 - 147
15 - 18 - 165
16 - 19 - 184
17 - 20 - 204
18 - 21 - 225
19 - 22 = 247
20 - 23 - 270

Sum of a Finite Arithmetic series

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

n = # of terms

a_1 = First term

a_n = last term

Arithmetic Series

Find the sum of each finite arithmetic series.

1) $1 + 3 + 5 + 7 + 9$

$\frac{5}{2}(1+9)$

$2.5(10)$

$= 25$

2) $4 + 9 + 14 + \ldots + 44$

$\frac{9}{2}(4+44)$

$4.5(48)$

216

3) $17 + 25 + 33 + \ldots + 65$

$\frac{7}{2}(17+65)$

$3.5(82)$

287

Write each arithmetic series in summation notation.

4) $10+7+4+\ldots+(-5)$

$\sum_{n=1}^{6} 13-3n$

5) $3+7+11+\ldots+31$

$\sum_{n=1}^{8} -1+4n$

6) $15+25+35+\ldots+75$

$\sum_{n=1}^{7} 5+10n$

Find the sum of each finite series.

7) $\sum_{n=2}^{6}(2n-1)$

$\frac{5}{2}(3+11)$

$2.5(14)=35$

$\sum_{n=2}^{6}(2n-1)$

$a_1=(2)(2)-1=3$

$a_n=2(6)-1=11$

$n=6-2+1=5$

8) $\sum_{n=2}^{5}(5n+3)$

$\frac{4}{2}(13+28)$

$2(41)$

$=82$

$\sum_{n=2}^{5}(5n+3)$

$a_1=5(2)+3)=13$

$a_n=5(5)+3=25+3=28$

$n=5-2+1=4$

9) $\sum_{n=1}^{8}(3-n)$

$\sum_{n=1}^{8}(3-n)$

$a_1 = 3-1 = 2$

$a_n = 3-8 = -5$

$n = 8-1+1 = 8$

$\frac{8}{2}(2+(-5))$

$4(-3) = -12$

10) $\sum_{n=1}^{4}(-n-3)$

$\sum_{n=1}^{4}(-n-3)$

$a_1 = -1-3 = -4$

$a_n = -4-3 = -7$

$n = 4$

$\frac{4}{2}(-4+-7)$

$2(-11) = -22$

Determine whether each list is a *sequence* or a *series* and *finite* or *infinite*.

11) 7, 12, 17, 22, 27

Finite

12) 8, 8.2, 8.4, 8.6, 8.8, 9.0.....

Infinite

13 40, 20, 10, 5, 2.5, 1.25.....

Infinite

14) . An embroidery pattern calls for five stitches in the first row and for three more stitches in each successive row. The 25th row, which is the last row, has 77 stitches. Find the total number of stitches in the pattern.

$n = 25 \quad a_1 = 5 \quad a_n = 77$

$\frac{25}{2}(5+77)$

$12.5(82)$

$1,025$