

More Practice: Arithmetic Series

KEY

Find the value of the sum:

1.  $8 + 11 + 14 + 17 + 20 + 23 + 26 = \frac{7}{2}(8 + 26) = \frac{7}{2}(34) = 119$

2.  $4 + 8 + 12 + 16 + \dots$  NO SUM

3.  $20 + 10 + 0 - 10 - 20 - 30 - 40 - 50 = \frac{8}{2}(20 - 50) = 4(-30) = -120$

4.  $13 + 24 + 35 + \dots + 178$   
 $178 = 13 + 11(n-1)$      $165 = 11(n-1)$      $S_n = \frac{16}{2}(13 + 178) = 8(191) = 1528$   
 $-13$      $-13$      $15 = n-1$      $16 = n$

5.  $34 + 31 + 28 + 25 + \dots + -8$   
 $-8 = 34 - 3(n-1)$      $-42 = -3(n-1)$      $14 = n-1$      $S_n = \frac{15}{2}(34 - 8) = 195$   
 $-34$      $-34$      $-3$      $-3$      $15 = n$

6.  $\frac{2}{3} + \frac{5}{3} + \frac{8}{3} + \dots + \frac{74}{3}$   
 $74 = 2 + 3(n-1)$      $24 = n-1$      $S_n = \frac{25}{2}\left(\frac{2}{3} + \frac{74}{3}\right) = 12.5\left(\frac{76}{3}\right) = \frac{950}{3}$   
 $72 = 3(n-1)$      $25 = n$

7.  $\sum_{n=1}^{45} 7 + 3(n-1) = \frac{45}{2}(7 + 139) = 22.5(146) = 3285$

$7 + 3(45-1)$   
 $7 + 3(44) = 139$

8.  $\sum_{n=1}^{\infty} 1 - 0.7(n-1)$  NO SUM

9.  $\sum_{n=6}^{23} 9 - 3(n-1) = \frac{18}{2}(-6 + -57) = -567$   
 $9 - 3(6-1) = 9 - 3(5) = 9 - 15 = -6$      $23 - 6 + 1 = 18$   
 $9 - 3(23-1) = 9 - 3(22) = 9 - 66 = -57$

10.  $\sum_{n=75}^{210} 3 + 4(n-1)$

$3 + 4(75-1) = 3 + 4(74) = 299$

$3 + 4(210-1) = 3 + 4(209) = 839$

$210 - 75 + 1 = 136$

$S_n = \frac{136}{2}(299 + 839)$

$= 77384$