



Math Olympiad and Problem Solving Programs
E220 - Intermediate Math Competitions
Problem Set 26.1 - Arithmetic Sequence and Series

Name:

Date:

Formulas: $a_n = a_1 + (n - 1)d$, $S_n = \frac{n}{2}(a_1 + a_n) = \frac{n}{2}(2a_1 + (n - 1)d)$.

1. $12.4 = \frac{62}{5}$

2. -13

3. $d = 889$

4. 5050

5. (a) 60 (b) 480 (c) 365

6. 8

7. 350

8. $C = 2 + 4 + 6 + \dots + 200 = \frac{100}{2}(2 + 200) = 50 \cdot 202 = 10100$.

$$D = 1 + 3 + 5 + \dots + 199 = \frac{100}{2}(1 + 199) = 50 \cdot 200 = 10000.$$

$$\frac{C + D}{C - D} = \frac{10100 + 10000}{10100 - 10000} = \frac{20100}{100} = 201$$

9. $113, 125, 137, 149, 161, 173$

10.

$$\begin{aligned} & (900 - 841) + (784 - 729) + \dots + (36 - 25) + (16 - 9) + (4 - 1) \\ &= 59 + 55 + \dots + 11 + 7 + 3 \quad \text{arithmetic series of 15 terms with } d = -4 \\ &= \frac{15}{2}(59 + 3) \\ &= 15 \cdot \frac{62}{2} = 15 \cdot 31 = 465 \end{aligned}$$