

Think It Through
September 29

1. Evaluate each of the following sums.

(a) $1 + 2 + 3 + \cdots + 100$

Solution: 5050

(b) $5 + 8 + 11 + \cdots + 545$

Solution: 49775

Solution: 17

2. What is n in the following expression?

$$1 + 2 + 3 + \cdots + (n - 1) + n + (n - 1) + \cdots + 3 + 2 + 1 = 289$$

Solution: 17

3. In an arithmetic sequence of 200 terms the 27^{th} term equals 2, and the 174^{th} term equals 4. Find the sum of all the terms in the sequence.

Solution: 600

4. An arithmetic sequence has 11 terms which sum to 220. What is the middle term in the sequence?

Solution: 20

5. Real numbers a_1, a_2, \dots, a_{99} form an arithmetic sequence. Suppose $\sum_{i=1}^{98} a_i = 205$. Find the value of $\sum_{i=1}^{99} a_i$.

Solution: 615

6. Consider an arithmetic sequence with terms a_1, a_2, \dots . Determine S_{143} if $a_{13} = \frac{1}{11}$ and $a_{13} = \frac{1}{13}$.

Solution: 72

7. Prove that for arithmetic sequence a_1, a_2, \dots, a_n , that the sum of the terms S_n , is

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