

**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

$$a_2 + a_5 + a_8 + \cdots + a_{98} = 205$$

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  $a_{11} = \frac{1}{11}$  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

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