

3.23
75

$$(a_1^2 - a_2^2) + (a_3^2 - a_4^2) + \dots + (a_{99}^2 - a_{100}^2)$$

$$(a_1 - a_2)(a_1 + a_2) + (a_3 - a_4)(a_3 + a_4) + \dots + (a_{99} - a_{100})(a_{99} + a_{100}) =$$

$$-d(a_1 + a_2) - d(a_3 + a_4) + \dots - d(a_{99} + a_{100}) =$$

$$-d(a_1 + a_2 + a_3 + a_4 + \dots + a_{99} + a_{100}) = -d \cdot S_{100}$$

$$S_{10} = 37 = \frac{10}{2} [2a_1 + d(10-1)] = 5 [2 + 9d] \rightarrow d = \frac{27}{45} = \frac{3}{5}$$

$$S_{100} = \frac{100}{2} \left[2 \cdot 1 + \frac{3}{5} \cdot 99 \right] = 50 \left(2 + \frac{297}{5} \right) = 100 + 2970 = 3070$$

$$-d \cdot S_{100} = -\frac{3}{5} \cdot 3070 = -1842$$