Answer on Question #58527 – Math – Algebra

Question

14+22+30+…+814

Solution

This sequence

$$14, 22, 30, ,.. ,814$$

is arithmetic progression.

The first term is

$$a_1=14,$$

the last term is

$$a_n = 814.$$

The general formula for the *n*th term is

$$a_{n=} a_1 + d(n-1). \quad (1)$$

The difference is

$$d = a_2 - a_1,$$

$$d = 22 - 14 = 8.$$

Substitute for $a_n = 814$, $a_1 = 14$, $d = 8$ into formula (1):

$$814 = 14 + 8(n-1),$$

$$814 = 14 + 8n - 8,$$

$$814 - 14 + 8 = 8n,$$

$$808 = 8n,$$

$$n = \frac{808}{8} = 101.$$

Substitute for

$$a_1 = 14, a_n = 814, n = 101$$

into the following formula of the sum of arithmetic progression:

$$S_n = \frac{a_1+a_n}{2} \cdot n,$$

$$S_n = \frac{14+814}{2} \cdot 101 = 41814.$$

Answer: 41814.