

Answer on Question #84683 – Math – Algebra

Question

The sum of three consecutive integers is one third the square of the middle number. Find the integers. Write an equation and solve.

Solution

Let the average number be n , then the first number of three consecutive numbers will be $n - 1$ and the last number will be $n + 1$.

Then one third of the square of the average number will be $\frac{1}{3} \times n^2$.

Now you can make an equation

$$(n - 1) + n + (n + 1) = \frac{1}{3} \times n^2$$

After simplification we get

$$3 \times n = \frac{1}{3} \times n^2 \text{ or } 9 \times n = n^2 \quad (1)$$

The first solution of this equation is $n = 0$. Accordingly, three integers satisfying the condition are $-1; 0; 1$; . (Check $(-1) + 0 + 1 = \frac{1}{3} \times 0^2$ or $0 = 0$).

Now equation (1) can be reduced by n : $\frac{(9 \times n)}{n} = \frac{n^2}{n}$ or $n = 9$. Accordingly, three integers satisfying the condition are $8; 9; 10$; . (Check $8 + 9 + 10 = \frac{1}{3} \times 9^2 = \frac{1}{3} \times 81 = 27$).

Answer:

The given condition is satisfied by two triples of integers:

$-1; 0; 1$; and $8; 9; 10$;