Arithmetic Progressions Ex 9.5 Q25

Answer :

Here, we are given an A.P. whose n^{th} term is given by the following expression $a_n = An + B$. We need to find the sum of first 20 terms.

So, here we can find the sum of the n terms of the given A.P., using the formula, $S_n = \left(\frac{n}{2}\right)(a+l)$

Where, a = the first term

l = the last term

So, for the given A.P,

The first term (a) will be calculated using $n = 1$ in the given equation for n^{th} term of A.P.

$$a = A(1) + B$$
$$= A + B$$

Now, the last term (l) or the n^{th} term is given

$$l = a_n = An + B$$

So, on substituting the values in the formula for the sum of n terms of an A.P., we get,

$$S_{20} = \left(\frac{20}{2}\right)\left[(A+B) + A(20) + B\right]$$
$$= 10\left[21A + 2B\right]$$
$$= 210A + 20B$$

Therefore, the sum of the first 20 terms of the given A.P. is $\boxed{S_{20} = 210A + 20B}$.

Arithmetic Progressions Ex 9.5 Q26

Answer :

Here, we are given an A.P. whose n^{th} term is given by the following expression, $a_n = 2 - 3n$. We need to find the sum of first 25 terms.

So, here we can find the sum of the n terms of the given A.P., using the formula, $S_n = \left(\frac{n}{2}\right)(a+l)$

Where, a = the first term

l = the last term

So, for the given A.P,

The first term (a) will be calculated using $n = 1$ in the given equation for n^{th} term of A.P.

$$a = 2 - 3(1)$$
$$= 2 - 3$$
$$= -1$$

Now, the last term (l) or the n^{th} term is given

$$l = a_n = 2 - 3n$$

So, on substituting the values in the formula for the sum of n terms of an A.P., we get,

$$S_{25} = \left(\frac{25}{2}\right)\left[(-1) + 2 - 3(25)\right]$$
$$= \left(\frac{25}{2}\right)\left[1 - 75\right]$$
$$= \left(\frac{25}{2}\right)(-74)$$
$$= (25)(-37)$$
$$= -925$$

Therefore, the sum of the 25 terms of the given A.P. is $\boxed{S_{25} = -925}$.

Arithmetic Progressions Ex 9.5 Q27

Answer :

Here, we are given an A.P. whose n^{th} term is given by the following expression, $a_n = 7-3n$. We need to find the sum of first 25 terms.

So, here we can find the sum of the n terms of the given A.P., using the formula, $S_n = \left(\frac{n}{2}\right)(a+l)$

Where, a = the first term

l = the last term

So, for the given A.P,

The first term (a) will be calculated using $n=1$ in the given equation for n^{th} term of A.P.

$$\begin{aligned} a &= 7-3(1) \\ &= 7-3 \\ &= 4 \end{aligned}$$

Now, the last term (l) or the n^{th} term is given

$$l = a_n = 7-3n$$

So, on substituting the values in the formula for the sum of n terms of an A.P., we get,

$$\begin{aligned} S_{25} &= \left(\frac{25}{2}\right)\left[(4)+7-3(25)\right] \\ &= \left(\frac{25}{2}\right)\left[11-75\right] \\ &= \left(\frac{25}{2}\right)(-64) \\ &= (25)(-32) \\ &= -800 \end{aligned}$$

Therefore, the sum of the 25 terms of the given A.P. is $\boxed{S_n = -800}$.

********** END **********