Arithmetic Progressions Ex 9.4 Q6

Answer :

Here, we are given three terms,

First term (a_1) = $8x+4$

Second term (a_2) = $6x-2$

Third term (a_3) = $2x+7$

We need to find the value of *x* for which these terms are in A.P. So, in an A.P. the difference of two adjacent terms is always constant. So, we get,

$$d = a_2 - a_1$$
$$d = (6x-2)-(8x+4)$$
$$d = 6x-8x-2-4$$
$$d = -2x-6 \quad \ldots\ldots (1)$$

Also,

$$d = a_3 - a_2$$
$$d = (2x+7)-(6x-2)$$
$$d = 2x-6x+7+2$$
$$d = -4x+9 \quad \ldots\ldots (2)$$

Now, on equating (1) and (2), we get,

$$-2x-6 = -4x+9$$
$$4x-2x = 9+6$$
$$2x = 15$$
$$x = \frac{15}{2}$$

Therefore, for $\boxed{x = \frac{15}{2}}$, these three terms will form an A.P.

Arithmetic Progressions Ex 9.4 Q7

Answer :

Here, we are given three terms which are in A.P.,

First term (a_1) = $x+1$

Second term (a_2) = $3x$

Third term (a_3) = $4x+2$

We need to find the value of *x*. So, in an A.P. the difference of two adjacent terms is always constant. So, we get,

$$d = a_2 - a_1$$
$$d = (3x)-(x+1)$$
$$d = 3x-x-1$$
$$d = 2x-1 \quad \ldots\ldots (1)$$

Also,

$$d = a_3 - a_2$$
$$d = (4x+2)-(3x)$$
$$d = 4x-3x+2$$
$$d = x+2 \quad \ldots\ldots (2)$$

Now, on equating (1) and (2), we get,

$$2x-1 = x+2$$
$$2x-x = 2+1$$
$$x = 3$$

Therefore, for $\boxed{x=3}$, these three terms will form an A.P.

Arithmetic Progressions Ex 9.4 Q8

Answer :

Here, we are given three terms and we need to show that they are in A.P.,

First term (a_1) = $(a-b)^2$

Second term (a_2) = (a^2+b^2)

Third term (a_3) = $(a+b)^2$

So, in an A.P. the difference of two adjacent terms is always constant. So, to prove that these terms are in A.P. we find the common difference, we get,

$d = a_2 - a_1$

$d = (a^2+b^2)-(a-b)^2$

$d = a^2+b^2-(a^2+b^2-2ab)$

$d = a^2+b^2-a^2-b^2+2ab$

$d = 2ab$ ...... (1)

Also,

$d = a_3 - a_2$

$d = (a+b)^2-(a^2+b^2)$

$d = a^2+b^2+2ab-a^2-b^2$

$d = 2ab$ ...... (2)

Now, since in equations (1) and (2) the values of *d* are equal, we can say that these terms are in A.P. with 2*ab* as the common difference.

Hence proved

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