

### 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,

 $d = a_2 - a_1$ 

$$d = (6x-2)-(8x+4)$$

$$d = 6x - 8x - 2 - 4$$

$$d = -2x - 6$$
 ..... (1)

Also.

 $d = a_3 - a_2$ 

$$d = (2x+7)-(6x-2)$$

$$d = 2x - 6x + 7 + 2$$

$$d = -4x + 9$$
 ..... (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  $x = \frac{15}{2}$ , 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 ..... (1)

Also,

 $d = a_3 - a_2$ 

d = (4x+2)-(3x)

d = 4x - 3x + 2

d = x + 2 .....(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,

$$d = a_2 - a_1$$

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

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

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

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

Also,

$$d = a_3 - a_2$$

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

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

$$d = 2ab \dots (2)$$

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

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