Arithmetic Progressions Ex 9.4 Q4

Answer :

Here, we are given that the angles of a quadrilateral are in A.P, such that the common difference is 10°.

So, let us take the angles as $a-d, a, a+d, a+2d$

Now, we know that the sum of all angles of a quadrilateral is 360°. So, we get,

$$(a-d)+(a)+(a+d)+(a+2d)=360$$
$$a-d+a+a+d+a+2d=360$$
$$4a+2(10)=360$$
$$4a=360-20$$

On further simplifying for *a*, we get,

$$a=\frac{340}{4}$$
$$a=85$$

So, the first angle is given by,

$$a-d=85-10$$
$$=75^\circ$$

Second angle is given by,

$$a=85^\circ$$

Third angle is given by,

$$a+d=85+10$$
$$=95^\circ$$

Fourth angle is given by,

$$a+2d=85+(2)(10)$$
$$=85+20$$
$$=105^\circ$$

Therefore, the four angles of the quadrilateral are $\boxed{75^\circ, 85^\circ, 95^\circ, 105^\circ}$.

Arithmetic Progressions Ex 9.4 Q5

Answer :

In the given problem, the sum of three terms of an A.P is 12 and the sum of their cubes is 288.

We need to find the three terms.

Here,

Let the three terms be $(a-d), a, (a+d)$ where, *a* is the first term and *d* is the common difference of the A.P

So,

$$(a-d)+a+(a+d)=12$$
$$3a=12$$
$$a=\frac{12}{3}$$
$$a=4$$

Also, it is given that

$$(a-d)^3+a^3+(a+d)^3=288$$

So, using the properties:

$$(a-b)^3=a^3-b^3+3ab^2-3a^2b$$
$$(a+b)^3=a^3+b^3+3ab^2+3a^2b$$

We get,

$$(a-d)^3+a^3+(a+d)^3=288$$
$$a^3-d^3-3a^2d+3d^2a+a^3+a^3+d^3+3a^2d+3d^2a=288$$
$$3a^3+6d^2a=288$$

Further solving for *d* by substituting the value of *a*, we get,

$$(4)^3 + 2d^2(4) = 96$$
$$64 + 8d^2 = 96$$
$$8d^2 = 96 - 64$$
$$d^2 = \frac{32}{8}$$

On further simplification, we get,

$$d = 4$$
$$d = \sqrt{4}$$
$$d = \pm 2$$

Now, here *d* can have two values +2 and -2.

So, on substituting the values of *a* = 4 and *d* = 2 in three terms, we get,

First term = $a - d$

So,

$$a - d = 4 - 2$$
$$= 2$$

Second term = *a*

So,

$$a = 4$$

Third term = $a + d$

So,

$$a + d = 4 + 2$$
$$= 6$$

Also, on substituting the values of *a* = 4 and $d = -2$ in three terms, we get,

First term = $a - d$

So,

$$a - d = 4 - (-2)$$
$$= 4 + 2$$
$$= 6$$

Second term = *a*

So,

$$a = 4$$

Third term = $a + d$

So,

$$a + d = 4 + (-2)$$
$$= 4 - 2$$
$$= 2$$

Therefore, the three terms are $\boxed{2, 4 \text{ and } 6 \text{ or } 6, 4 \text{ and } 2}$.

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