



Visualizing shapes Ex 19.1 Q5

Answer :

No, because every polyhedron satisfies Euler's formula, given below:

$$F + V = E + 2$$

Here, number of faces $F = 10$

Number of edges $E = 20$

Number of vertices $V = 15$

So, by Euler's formula:

$$\text{LHS : } 10 + 15 = 25$$

$$\text{RHS : } 20 + 2 = 22,$$

which is not true because $25 \neq 22$

Hence, Euler's formula is not satisfied and no polyhedron may be formed.

visualizing shapes Ex 19.1 Q6

Answer :

(i)

In the given polyhedron:

Edges $E = 15$

Faces $F = 7$

Vertices $V = 10$



(i)

Now, putting these values in Euler's formula:

$$\text{LHS : } F + V$$

$$= 7 + 10$$

$$= 17$$

$$\text{LHS : } E + 2$$

$$= 15 + 2$$

$$= 17$$

$$\text{LHS} = \text{RHS}$$

Hence, the Euler's formula is satisfied.

(ii)

In the given polyhedron:

Edges $E=16$

Faces $F=9$

Vertices $V=9$



(ii)

Now, putting these values in Euler's formula:

RHS : $F+V$

$$= 9+9$$

$$= 18$$

LHS : $E + 2$

$$= 16 + 2$$

$$= 18$$

LHS = RHS

Hence, Euler's formula is satisfied.

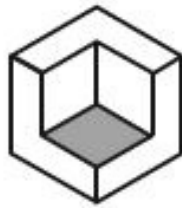
(iii)

In the following polyhedron:

Edges $E=21$

Faces $F=9$

Vertices $V=14$



(iii)

Now, putting these values in Euler's formula:

LHS : $F+V$

$$= 9+14$$

$$= 23$$

RHS : $E+2$

$$=21+2$$

$$=23$$

This is true.

Hence, Euler's formula is satisfied.

(iv)

In the following polyhedron:

Edges $E=8$

Faces $F=5$

Vertices $V=5$



(iv)

Now, putting these values in Euler's formula:

LHS : $F+V$

$$= 5 + 5$$

$$= 10$$

RHS : $E + 2$

$$= 8 + 2$$

$$= 10$$

LHS = RHS

Hence, Euler's formula is satisfied.

(v)

In the following polyhedron:

Edges $E=16$

Faces $F=9$

Vertices $V=9$



(v)

Now, putting these values in Euler's formula:

LHS : $F+V$

$$= 9 + 9$$

$$= 18$$

RHS : $E + 2$

$$= 16 + 2$$

$$= 18$$

LHS = RHS

Hence, Euler's formula is satisfied.

visualizing shapes Ex 19.1 Q7

Answer :

We know that the Euler's formula is: $F+V = E+2$

(i)

The number of vertices V is 6 and the number of edges E is 12.

Using Euler's formula:

$$F+6 = 12+2$$

$$F+6 = 14$$

$$F = 14-6$$

$$F = 8$$

So, the number of faces in this polyhedron is 8.

(ii)

Faces, $F = 5$

Edges, $E = 9$.

We have to find the number of vertices.

Putting these values in Euler's formula:

$$5+V = 9+2$$

$$5+V = 11$$

$$V = 11-5$$

$$V = 6$$

So, the number of vertices in this polyhedron is 6.

(iii)

Number of faces $F = 20$

Number of vertices $V = 12$

Using Euler's formula:

$$20+12 = E+2$$

$$32 = E+2$$

$$E+2 = 32$$

$$E = 32-2$$

$$E = 30.$$

So, the number of edges in this polyhedron is 30.

***** END *****