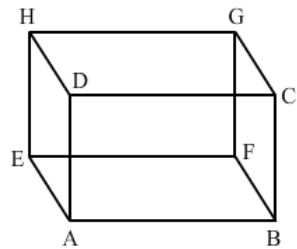


Three Dimensional Shapes Ex 19A

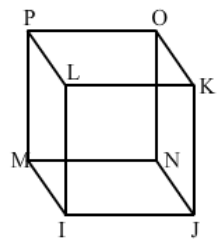
Q1.

Answer :

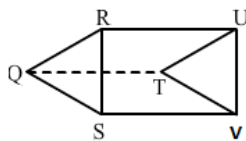
(i) A cuboid has 6 faces, namely $ABCD$, $EFGH$, $HDAE$, $GCBF$, $HDCG$ and $EABF$.



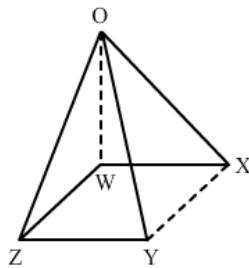
(ii) A cube has 6 faces, namely $IJKL$, $MNOP$, $PLIM$, $OKJN$, $LKOP$ and $IJNM$.



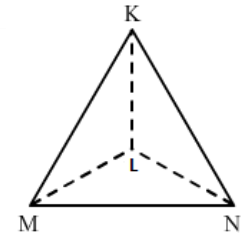
(iii) A triangular prism has 5 faces (3 rectangular faces and 2 triangular faces), namely $QRUT$, $QTVS$, $RUVS$, QRS and TUV .



(iv) A square pyramid has 5 faces (4 triangular faces and 1 square face), namely OWZ , OWX , OXY , OYZ and $WXYZ$.



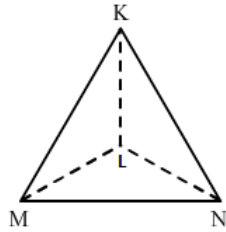
(v) A tetrahedron has 4 triangular faces, namely KLM , KLN , LMN and KMN .



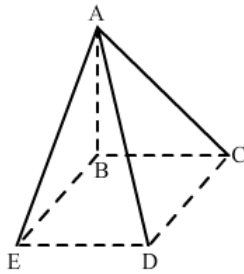
Q2.

Answer :

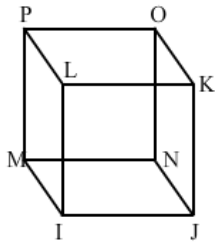
(i) A tetrahedron has 6 edges, namely KL , LM , LN , MN , KN and KM .



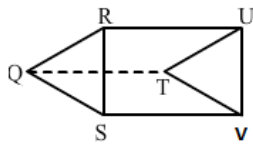
(ii) A rectangular pyramid has 8 edges, namely AB , AE , AD , AC , EB , ED , DC and CB .



(iii) A cube has 12 edges, namely PL , LK , KO , OP , MN , NJ , JI , IM , PM , LI , ON and KJ .



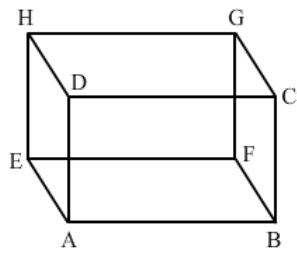
(iv) A triangular prism has 9 edges, namely QR , RS , QS , TU , TV , UV , QT , RU , and SV .



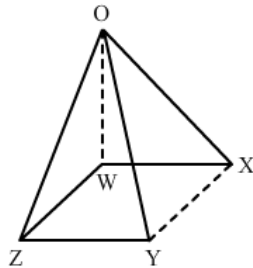
Q3.

Answer :

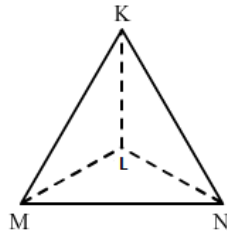
(i) A cuboid has 8 vertices, namely *A, B, C, D, E, F, G* and *H*.



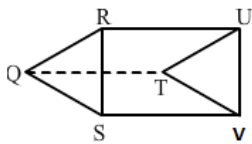
(ii) A square pyramid has 5 vertices, namely *O, W, X, Y* and *Z*.



(iii) A tetrahedron has 4 vertices, namely *K, L, M* and *N*.



(iv) A triangular prism has 6 vertices, namely *Q, R, S, T, U* and *V*.



Q4.

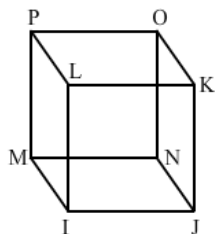
Answer :

(i) A cube has 8 vertices, 12 edges and 6 faces.

Vertices: *I, J, K, L, M, N, O* and *P*

Edges : *IJ, JN, NM, MI, PL, LK, KO, OP, PM, LI, KJ*, and *ON*

Faces : *MNJI, POKL, PLIM, OKJN, PONM* and *LKJI*



(ii) The point at which the three faces of a figure meet is known as its vertex.

(iii) A cuboid is also known as a rectangular cube.

(iv) A triangular pyramid is called a tetrahedraon.

Three Dimensional Shapes

Ex 19B

Q1.

Answer :

The Euler's relation for a three dimensional figure can be expressed in the following manner:

$$F - E + V = 2$$

Here,

F – Number of faces

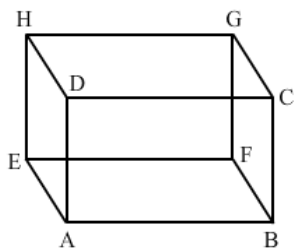
E – Number of edges

V – Number of vertices

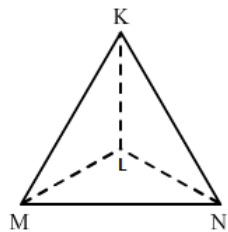
Q2.

Answer :

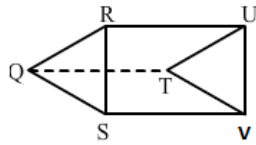
(i) A cuboid has 12 edges, namely AD , DC , CB , BA , EA , FB , HD , DC , CG , GH , HE , and GF .



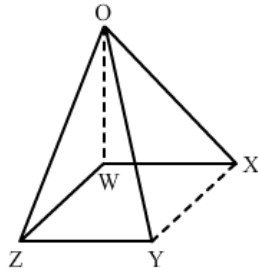
(ii) A tetrahedron has 6 edges, namely KL , LM , MN , NL , KM and KN .



(iii) A triangular prism has 9 edges, namely $QR, RS, SQ, TU, UV, VT, RU, SV$ and QT .



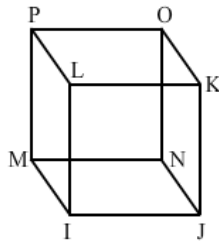
(iv) A square pyramid has 8 edges, namely $OW, OX, OY, OZ, WX, XY, YZ$ and ZW .



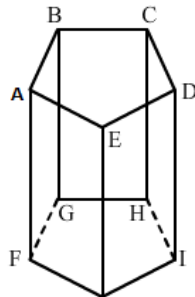
Q3.

Answer :

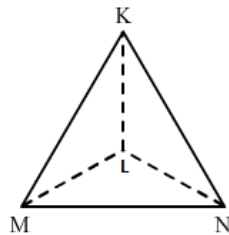
(i) A cube has 6 faces, namely $IJKL, MNOP, PLIM, OKJN, POKL$ and $MNJI$.



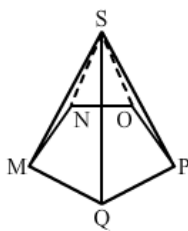
(ii) A pentagonal prism has 7 faces, i.e. 2 pentagons and 5 rectangles, namely $ABCDE, FGHIJ, ABGF, AEJF, EDIJ, DCHI$ and $CBGH$.



(iii) A tetrahedron has 4 faces, namely KLM, KLN, LMN and KMN .



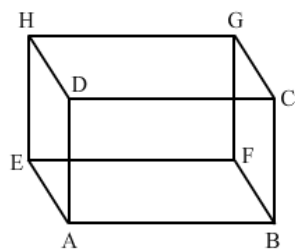
(iv) A pentagonal pyramid has 6 faces, i.e. 1 pentagon and 5 triangles, namely $NOPQM, SNM, SOP, SNO, SMQ$ and SQP .



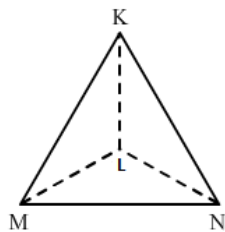
Q4.

Answer :

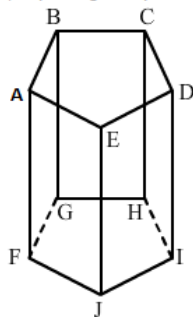
(i) A cuboid has 8 vertices, namely A, B, C, D, E, F, G and H .



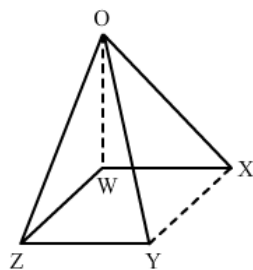
(ii) A tetrahedron has 4 vertices, namely K, L, M and N .



(iii) A pentagonal prism has 10 vertices, namely $A, B, C, D, E, F, G, H, I$ and J .



(iv) A square pyramid has 5 vertices, namely O, W, X, Y and Z .



Q5.

Answer :

Euler's relation is:

$$F - E + V = 2$$

Here :

F – Number of faces

E – Number of edges

V – Number of vertices

(i) A square prism

(There is an error in this question. It should have been a square prism rather than square.)

$$\text{Number of faces} = F = 2 \text{ squares} + 4 \text{ rectangular} = 6$$

$$\text{Number of edges} = E = 12$$

$$\text{Number of vertices} = V = 8$$

$$\Rightarrow (F - E + V) = 6 - 12 + 8 = 2$$

(ii) A tetrahedron

$$\text{Number of faces} = F = 4$$

$$\text{Number of edges} = E = 6$$

$$\text{Number of vertices} = V = 4$$

$$\Rightarrow (F - E + V) = 4 - 6 + 4 = 2$$

(iii) A triangular prism

$$\text{Number of faces} = F = 2 \text{ triangular} + 3 \text{ rectangular} = 5$$

$$\text{Number of edges} = E = 9$$

$$\text{Number of vertices} = V = 6$$

$$\Rightarrow (F - E + V) = 5 - 9 + 6 = 2$$

(iv) A square pyramid

$$\text{Number of faces} = F = 2 \text{ triangular} + 3 \text{ rectangular} = 5$$

$$\text{Number of edges} = E = 8$$

$$\text{Number of vertices} = V = 5$$

$$\Rightarrow (F - E + V) = 5 - 8 + 5 = 2$$