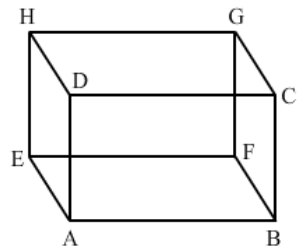


# Three Dimensional Shapes Ex 19A

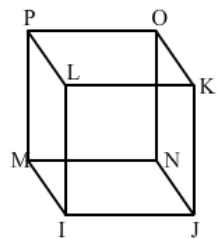
Q1.

**Answer :**

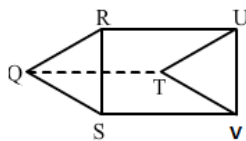
(i) A cuboid has 6 faces, namely  $ABCD$ ,  $EFGH$ ,  $HDAE$ ,  $GCBF$ ,  $HDCG$  and  $EABF$ .



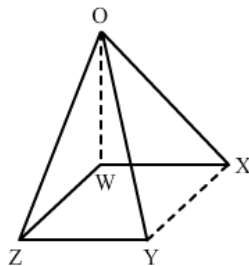
(ii) A cube has 6 faces, namely  $IJKL$ ,  $MNOP$ ,  $PLIM$ ,  $OKJN$ ,  $LKOP$  and  $IJNM$ .



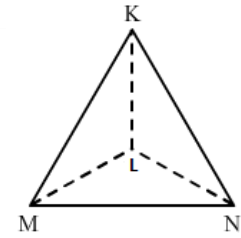
(iii) A triangular prism has 5 faces (3 rectangular faces and 2 triangular faces), namely  $QRUT$ ,  $QTVS$ ,  $RUVS$ ,  $QRS$  and  $TUV$ .



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



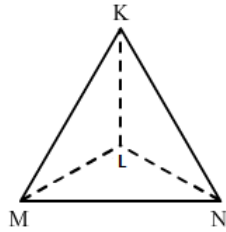
(v) A tetrahedron has 4 triangular faces, namely  $KLM$ ,  $KLN$ ,  $LMN$  and  $KMN$ .



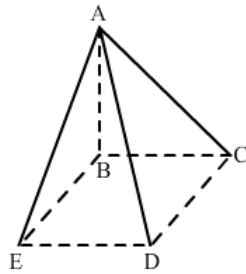
Q2.

**Answer :**

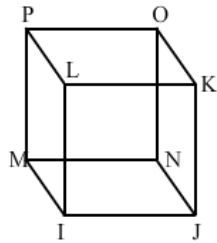
(i) A tetrahedron has 6 edges, namely  $KL$ ,  $LM$ ,  $LN$ ,  $MN$ ,  $KN$  and  $KM$ .



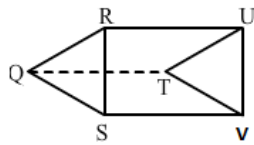
(ii) A rectangular pyramid has 8 edges, namely  $AB$ ,  $AE$ ,  $AD$ ,  $AC$ ,  $EB$ ,  $ED$ ,  $DC$  and  $CB$ .



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



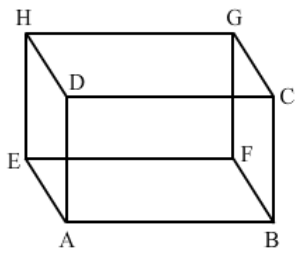
(iv) A triangular prism has 9 edges, namely  $QR$ ,  $RS$ ,  $QS$ ,  $TU$ ,  $TV$ ,  $UV$ ,  $QT$ ,  $RU$ , and  $SV$ .



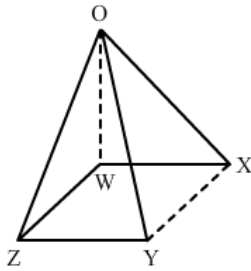
Q3.

**Answer :**

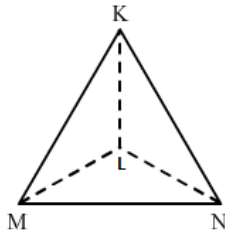
(i) A cuboid has 8 vertices, namely  $A, B, C, D, E, F, G$  and  $H$ .



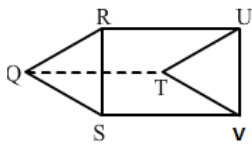
(ii) A square pyramid has 5 vertices, namely  $O, W, X, Y$  and  $Z$ .



(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.

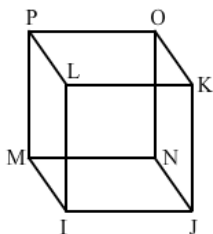
**Answer :**

(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

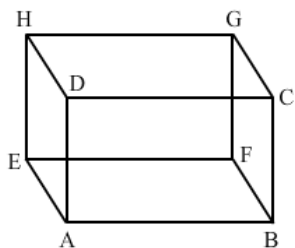
$E$  – Number of edges

$V$  – Number of vertices

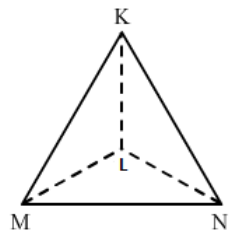
Q2.

**Answer :**

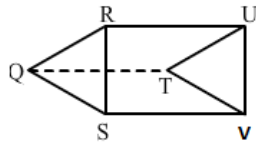
(i) A cuboid has 12 edges, namely  $AD$ ,  $DC$ ,  $CB$ ,  $BA$ ,  $EA$ ,  $FB$ ,  $HD$ ,  $DC$ ,  $CG$ ,  $GH$ ,  $HE$ , and  $GF$ .



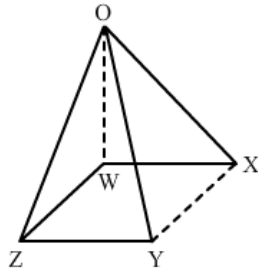
(ii) A tetrahedron has 6 edges, namely  $KL$ ,  $LM$ ,  $MN$ ,  $NL$ ,  $KM$  and  $KN$ .



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



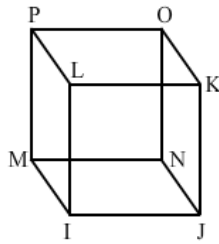
(iv) A square pyramid has 8 edges, namely  $OW, OX, OY, OZ, WX, XY, YZ$  and  $ZW$ .



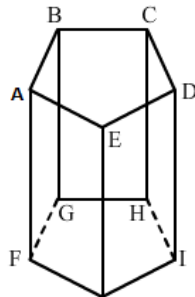
Q3.

**Answer :**

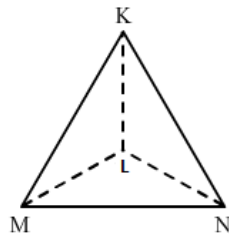
(i) A cube has 6 faces, namely  $IJKL, MNOP, PLIM, OKJN, POKL$  and  $MNJI$ .



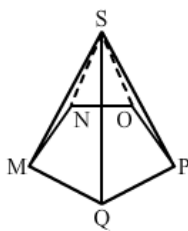
(ii) A pentagonal prism has 7 faces, i.e. 2 pentagons and 5 rectangles, namely  $ABCDE, FGHIJ, ABGF, AEJF, EDIJ, DCHI$  and  $CBGH$ .



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



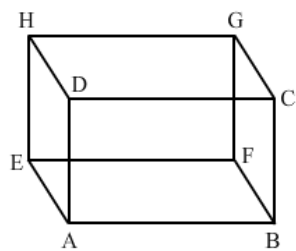
(iv) A pentagonal pyramid has 6 faces, i.e. 1 pentagon and 5 triangles, namely  $NOPQM, SNM, SOP, SNO, SMQ$  and  $SQP$ .



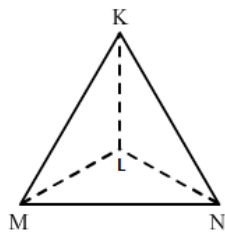
Q4.

**Answer :**

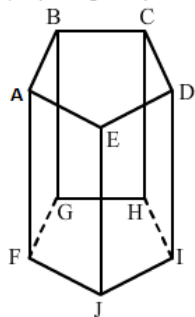
(i) A cuboid has 8 vertices, namely  $A, B, C, D, E, F, G$  and  $H$ .



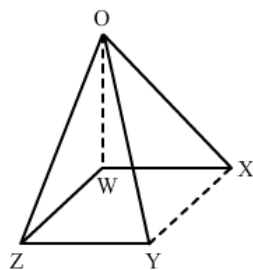
(ii) A tetrahedron has 4 vertices, namely  $K, L, M$  and  $N$ .



(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

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

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

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

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