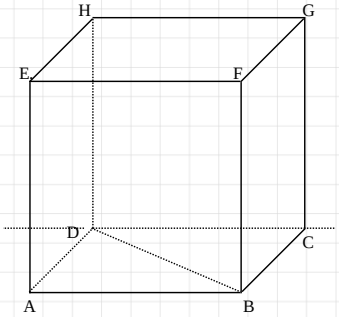
A. Distance From Point to a Line in Space

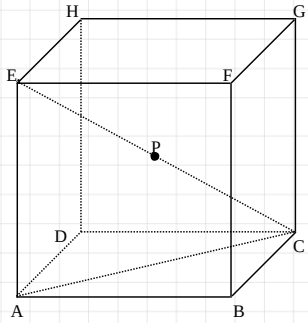
Look at the $ABCD.EFGH$ cube. Show

- the projection of point A on CD
- the projection of point A on BD

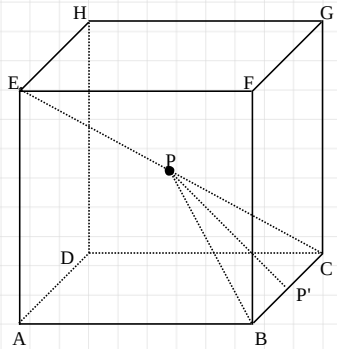


Let P be midpoint of CE in $ABCD.EFGH$ cube with 8 cm.

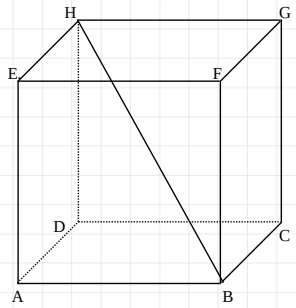
- Find the distance from C to P



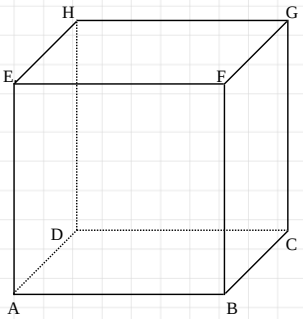
- Find the distance from P to BC



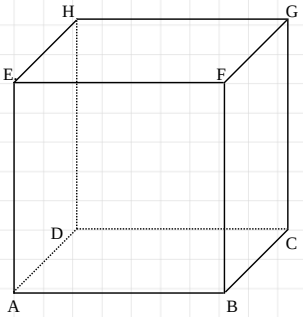
Example: The length of edges in $ABCD.EFGH$ cube is 6 cm. Find the distance from A point to BH line



Example: The dimension of $ABCD.EFGH$ cube is 8 cm. Find the distance from A point to BG line



Example: Length of the edge of $ABCD.EFGH$ cube is 10 cm. K is the midpoint of EG . Find the distance from E point to AK line

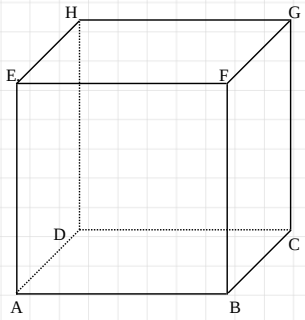


Active Note Book

Example: (UN 2012/C37)

Panjang rusuk kubus $ABCD.EFGH$ adalah 12 cm. Jika P titik tengah CG, maka jarak titik P dengan garis HB adalah ...

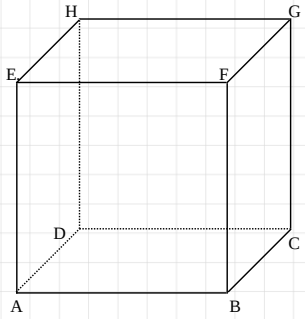
The length of the edges of $ABCD.EFGH$ cube is 12 cm. If P is the midpoint of CG, then the distance from P to HB line is ...



Example: (UN 2010 PAKET A)

Diketahui kubus $ABCD.EFGH$ dengan panjang rusuk 4 cm. Titik P adalah titik potong AH dengan ED dan titik Q adalah titik potong FH dengan EG. Jarak titik B dengan garis PQ adalah ...

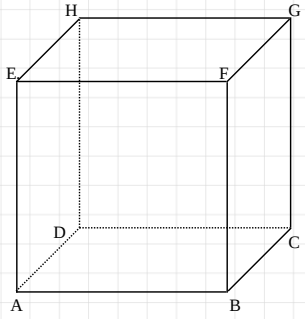
Given $ABCD.EFGH$ cube with the length of its edges is 12 cm. P is the intersection point of AH with ED and Q is the intersection point of FH with EG. The distance from B to PQ line is ...



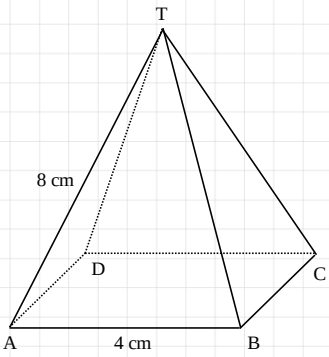
Example: (UN 2010 PAKET A)

Diketahui kubus $ABCD.EFGH$ dengan panjang rusuk 10 cm. Jarak titik F ke garis AC adalah ...

Given $ABCD.EFGH$ cube with the length of its edges is 10 cm. The distance from F to AC line is ...



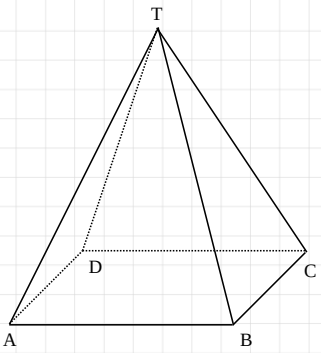
Example: Given a regular pyramid $T.ABCD$ with the length of its basic edges 4 cm and its lateral edges is 8 cm. C is the midpoint of AD. Find the distance from C point to TA line



Example: (UN 2004)

Diketahui limas segi empat beraturan $T.ABCD$ dengan $AB = 6\sqrt{2}$ cm dan $AT = 10$ cm. Apabila P titik tengah CT, maka jarak titik P ke diagonal sisi BD adalah ...

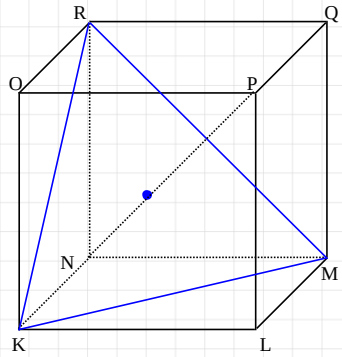
Given a regular pyramid $T.ABCD$ with $AB = 6\sqrt{2}$ cm and $AT = 10$ cm. If P is the midpoint of CT, then the distance from P point to BD diagonal is ...

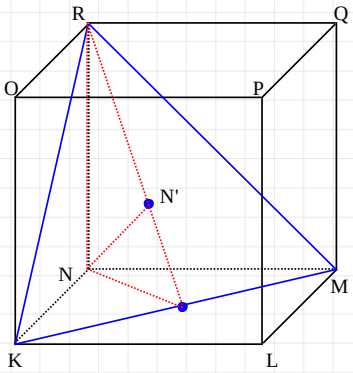


B. Distance From Point to a Plane in Space

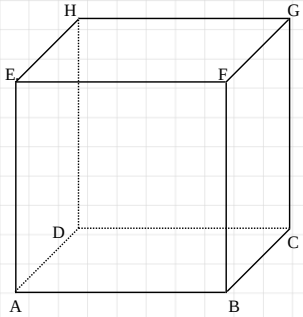
Given $ABCD.EFGH$ cube with 6 cm.

- Find the distance from N to KMR

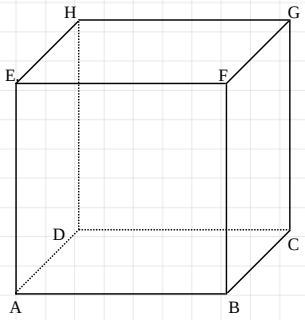




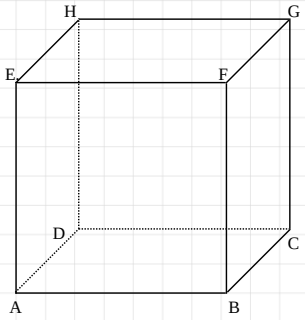
Example: The length of edges in $ABCD.EFGH$ cube is 6 cm.
Find the distance from E point to HFA plane



Example: (UN 2012/A13)
Diketahui kubus $ABCD.EFGH$ dengan panjang rusuk 4 cm.
Jarak titik H ke bidang ACF adalah ...
Given $ABCD.EFGH$ cube with the length of its edges is 4 cm.
The distance from H to ACF plane is ...



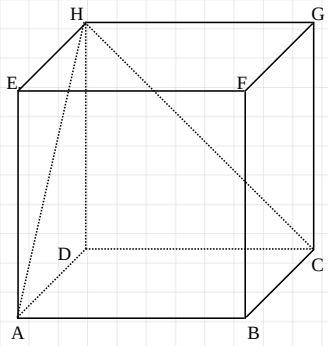
Example: (UN 2009 PAKET A/B)
Kubus $ABCD.EFGH$ mempunyai panjang rusuk a cm. Titik K pada perpanjangan DA sehingga $KA=\frac{1}{3}KD$. Jarak titik K ke bidang $BDHF$ adalah ...
Given $ABCD.EFGH$ cube with the length of its edges is a cm.
K is on the extension of DA such that $KA=\frac{1}{3}KD$. The distance from K to $BDHF$ plane is ...



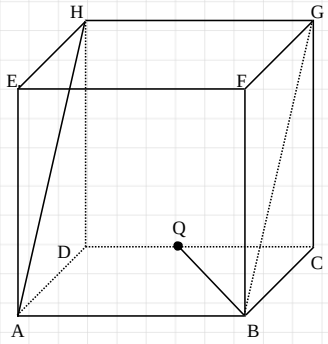
C. Angle in Space

Given $ABCD.EFGH$ cube.

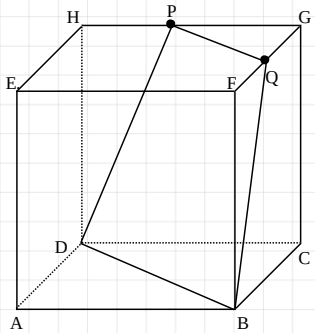
- Show the angle between AH and HC



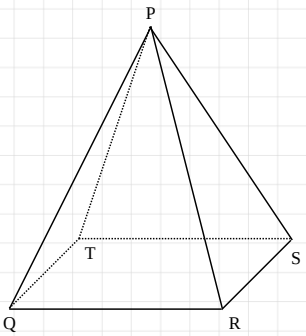
- Q is the midpoint of CD. Show the angle between AH and QB



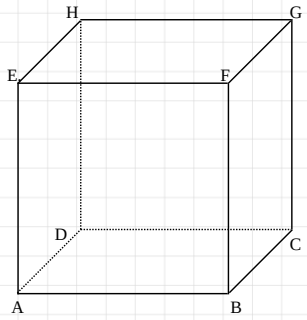
- Q is the midpoint of FG and P is the midpoint of HG. Show the angle between $BDPQ$ plane and CG line



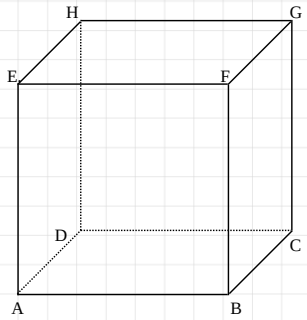
Example: In a regular pyramid of $P.QRST$, $QR = 3$ and $QP = 4$. Find the tangent of angle formed by QP and $QRST$



Example: The length of $ABCD.EFGH$ cube edges is 6 cm. If P is the midpoint of AE, then find the cosine of the angle formed by PBD and EBD.



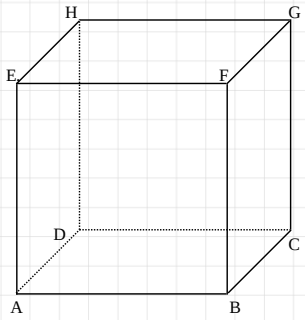
Example: In $ABCD.EFGH$ rectangular prism, $AB = 6$ cm, $BC = 12$ and $CG = 12$. If P is the midpoint of AB and Q is the midpoint of CG, then find the sine of the angle formed by PQ and $ABCD$.



Example: (UN 2012/B25)

Kubus $ABCD.EFGH$ memiliki rusuk 4 cm. Sudut Antara AE dan bidang AFH adalah α . Nilai $\sin\alpha = ...$

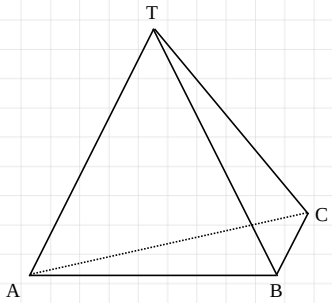
$ABCD.EFGH$ cube has an edge of 4 cm in length . The angle between AE and AFH planes is α . $\sin\alpha = ...$



Example: (UN 2012/E52)

Diketahui limas segitiga beraturan $T.ABC$ dengan rusuk 6 cm. Nilai kosinus sudut antara garis TC dengan ABC adalah ...

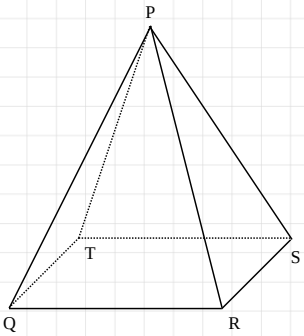
Given a regular triangular pyramid $T.ABC$ with 3 cm edge in length. The cosine of the angle between TC line and ABC is ...



Example: (UN 2012/C37)

Diketahui limas segi empat beraturan $P.QRST$ dengan rusuk alas 3 cm dan rusuk tegak $3\sqrt{2}$ cm. Tangen sudut antara paris PT dan alas $QRST$ adalah ...

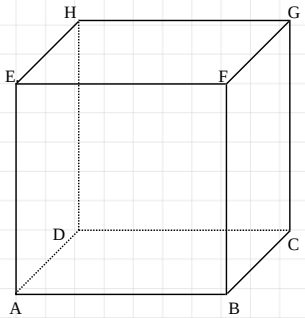
Given a regular pyramid $P.QRST$ with $QR = 3$ cm and $AP = 3\sqrt{2}$ cm. The tangent of the angle between PT line and $QRST$ plane is ...



Example: (UN 2010 PAKET A)

Diketahui kubus $ABCD.EFGH$ dengan rusuk rusuk a satuan panjang. Titik T adalah titik tengah rusuk HG . Jika θ adalah sudut antara TB dan $ABCD$, maka nilai $\tan\theta$ adalah ...

$ABCD.EFGH$ cube with a unit length edge is given. T is the midpoint of HG . If θ is the angle between TB and $ABCD$, then $\tan\theta$ is ...



Review Test

1. Diketahui kubus *ABCD.EFGH* dengan rusuk 4 cm. Titik *P* dan *Q* terletak pada *FB* dan *HD*. Jika *BP* = *DQ* = $\frac{1}{4}$ *HD*, luas irisan bidang melaui*A*, *P*, dan *Q* dengan kubus adalah.....
   a. $24\sqrt{2}$ cm²
   b. $12\sqrt{2}$ cm²
   c. 6 cm²
   d. $24\sqrt{3}$ cm²
   e. $3\sqrt{3}$ cm²
2. Limas segiempat yang beraturan *T.ABCD* memiliki panjang rusuk alas 6 cm. jarak titik *D* dan bidang *ACH* adalah.....
   a. $2\sqrt{3}$ cm
   b. $4\sqrt{3}$ cm
   c. $6\sqrt{3}$ cm
   d. $2\sqrt{2}$ cm
   e. $3\sqrt{6}$ cm
3. Diketahui kubus *ABCD.EFGH* dengan panjang rusuk 6 cm. Jarak titik *D* dan bidang *ACH* adalah.....
   a. $\sqrt{3}$ cm
   b. $2\sqrt{2}$ cm
   c. $3\sqrt{3}$ cm
   d. $3\sqrt{2}$ cm
   e. $4\sqrt{3}$ cm
4. Diketahui kubus *ABCD.EFGH* dengan rusuk 6 cm. Jarak titik *F* dan *AH* adalah.....
   a. $3\sqrt{2}$ cm
   b. $3\sqrt{3}$ cm
   c. $3\sqrt{5}$ cm
   d. $3\sqrt{6}$ cm
   e. $3\sqrt{10}$ cm
5. Pada kubus *ABCD.EFGH* dengan rusuk 2 cm, niali sin $\angle$ (*CG, BDG*) =.....
   a. $\frac{1}{6}\sqrt{3}$
   b. $\frac{1}{5}\sqrt{3}$
   c. $\frac{1}{3}\sqrt{3}$
   d. $\frac{1}{6}\sqrt{3}$
   e. $\frac{1}{3}\sqrt{6}$
6. Diketahui bidang empat *D,ABC* dengan alas segitiga *ABC* siku-siku di *A* dan *AB* = *AC* = α . Proyeksi titik *D* pada Δ *ABC* adalah titik *P* yang merupakan tengah-tengah *BC* dan *PD* = 2α . Niali sin $\angle$ (*DA*, alas) =.....
   a. $\frac{2}{3}$
   b. $\frac{2}{3}\sqrt{2}$
   c. $\frac{2}{5}\sqrt{5}$
   d. $\frac{2}{5}\sqrt{3}$
   e. $\frac{2}{3}\sqrt{6}$
7. Diketahui kubus *ABCD.DEFG* dengan rusuk 4 cm. Titik *P* adalah pertengahan rusuk *BC*. Panjang preyoksi *GP* pada bidang *BDHP* adalah.....
   a. $5\sqrt{3}$ cm
   b. $3\sqrt{3}$ cm
   c. $3\sqrt{2}$ cm
   d. $\frac{8}{3}\sqrt{2}$ cm
   e. $2\sqrt{2}$ cm
8. Diketahui kubus *ABCD.EFGH* dengan panjang rusuk 6 cm. nilai sin $\angle$ (*BDE, BDG*) =.....
   a. $\frac{1}{4}$
   b. $\frac{1}{3}$
   c. $\frac{1}{2}\sqrt{2}$
   d. $\frac{2}{3}\sqrt{2}$
   e. $\frac{8}{9}$
9. Diketahui bidang empat *T.PQR*. Rusuk-rusuk *TP*, *TQ*, da *TR* saling tegak lurus dititik *T*. Panjang *PQ* = *PR* = $2\sqrt{2}$ cm dan *PT* = 2 cm. Nilai tan $\angle$ (*PQR, TQR*) =.....
   a. $\sqrt{3}$
   b. $\sqrt{2}$
   c. $\frac{1}{2}\sqrt{3}$
   d. $\frac{3}{2}\sqrt{3}$
   e. $\frac{1}{4}\sqrt{3}$
10. Diketahui bidang empat beraturan *D.ABC* dengan rusuk 7 $\sqrt{2}$ cm. Jarak titik *D* dan bidang *ABC* adalah.....
    a. $\frac{14}{3}\sqrt{3}$ cm
    b. $7\sqrt{3}$ cm
    c. $\frac{7}{3}\sqrt{6}$ cm
    d. $\frac{7}{2}\sqrt{6}$ cm
    e. $\frac{7}{6}\sqrt{6}$ cm