Solution Book of Mathematic

Ssnior 2 Part I

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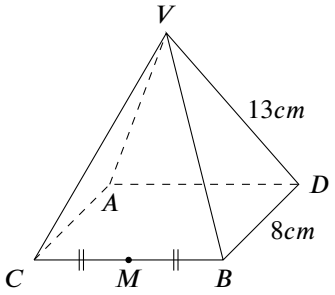
Contents

1. The diagram below shows a regular pyramid, the length of its lateral edge is $12cm$, its base $ABCD$ is a square with side length of $8cm$, M is the midpoint of BC. Find:

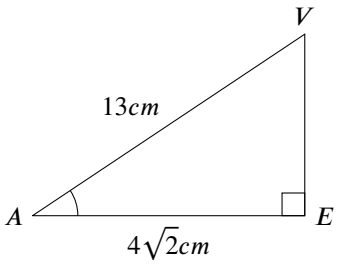


(a) The angle formed by the lateral edge and the base of the pyramid.

Sol. Let the foot point of the pyramid be E.

$$\begin{aligned}\text{In } ABCD,\ AB &= \sqrt{AD^2 + BD^2}\\ &= \sqrt{8^2 + 8^2}\\ &= \sqrt{128}cm\\ &= 8\sqrt{2}\\ AE &= \frac{AB}{2}\\ &= 4\sqrt{2}cm\end{aligned}$$

The angle formed by the lateral edge and the base of the pyramid is $\angle VAE$.



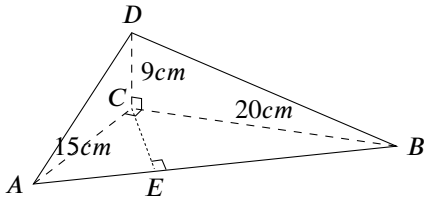
(b) The angle formed by line VM and the base of the pyramid.

2. In the pyramid shown below, ΔABC is a right-angled triangle, CD is perpendicular to plane ABC, CE is perpendicular to AB. Given that $AC = 15cm$, $BC = 20cm$ and $CD = 9cm$. Find:

(a) The length of CE.

(b) $\angle CDE$.

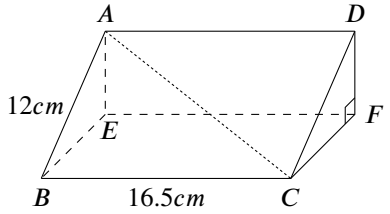
(c) The angle formed by line AD and plane ABC.



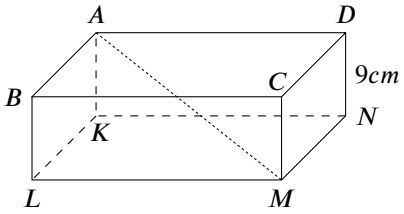
3. The diagram below shows a right prism, its base CDF is a right-angled triangle. Given that $BC = 16.5cm$ and $AB = 12cm$. Assume that $CF = 2DF$, find:

(a) The angle formed by line AB and plane $BCFE$.

(b) The angle formed by line AC and plan $BCFE$.



4. The diagram below shows a cuboid with volume of $300cm^3$. Given that $AD = 2DC$ and $DN = 9cm$. Find the angle formed by line AM and plane $KLMN$.

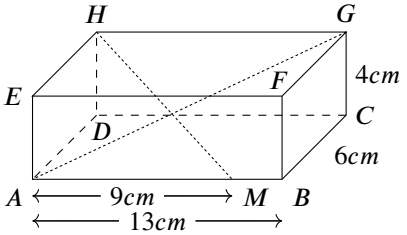


5. The diagram below shows a cuboid. Given that $AB = 13cm$, $BC = 6cm$, $CG = 4cm$. M is a point on AB, $AM = 9cm$. Find:

(a) The angle formed by line HM and plane $ABCG$.

(b) The angle formed by line HM and plane $HDAE$.

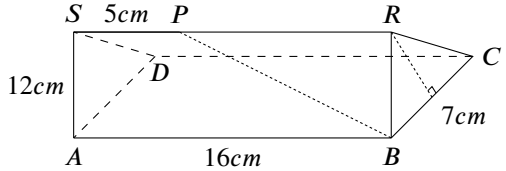
(c) The angle formed by line AG and plane $CDHG$.



6. The diagram below shows a regular prism, its bases ADS and BCR are equiliteral triangles. Given that $AB = 16cm$, $BC = 7cm$, $SP = 5cm$. Find:

(a) The length of BP.

(b) The angle formed by line BP and plane $ABCD$.

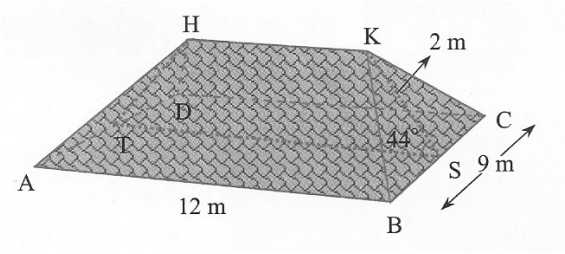


7. The diagram below shows a roof, HK is the ridge of the roof, its edges HA, HD, KB, KC are euqal in length. Both of the planes HAD and KBC form a 44^o angle with plane $ABCD$. Given that S and T are the midpoints of BC and AD respectively. Find:

   (a) The distance from line HK to plane $ABCD$.

   (b) The length of HK.

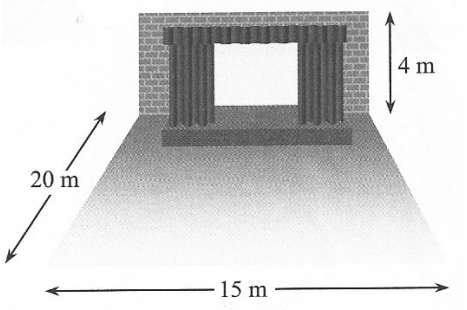
   (c) The angle formed by line HA and plane $ABCD$.



8. The length, width and height of a hall are $20m$, $15m$, and $4m$ respectively. Find:

   (a) The length of the diagonal of the hall.

   (b) The angle formed by the diagonal and the floor of the hall.



9. In the diagram below, $ABCD$ represents a rectangular plank with length and width of $60cm$ and $36cm$ respectively, its base BC is on the ground and the top of it lies on the wall. Assume that the distance between BC and the corner of the wall is $12cm$, find the angle formed by the diagonal BD of the plank and the ground.