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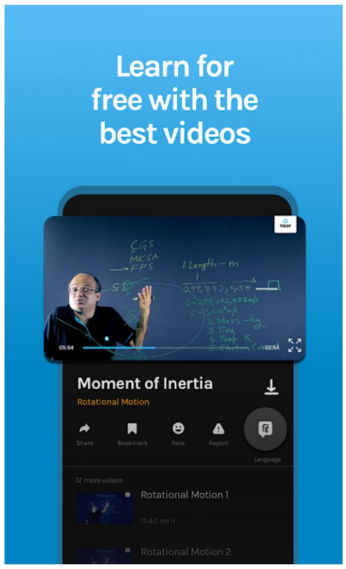

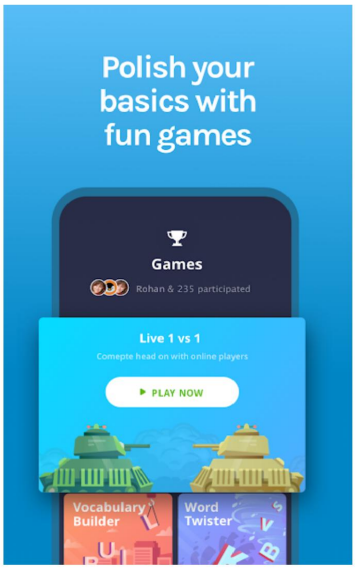

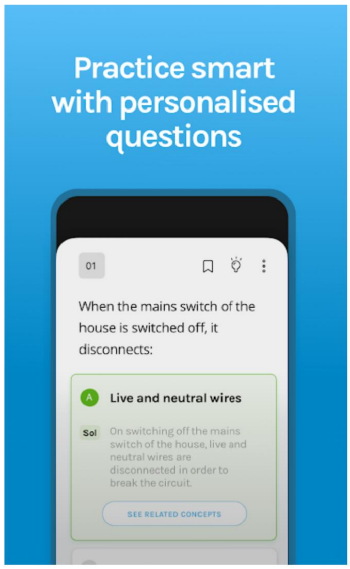

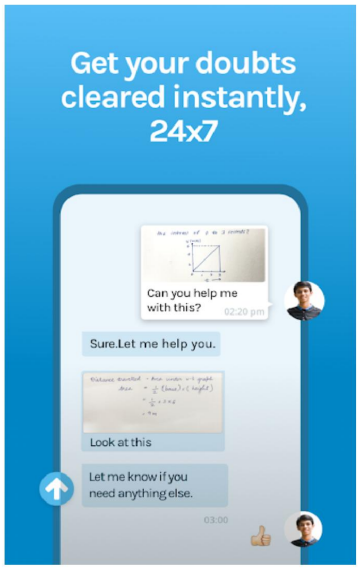

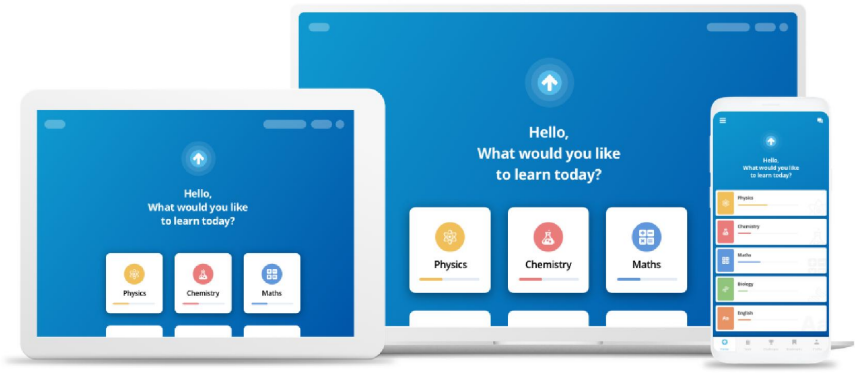

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- Class 9 English

#463868

Show that of all line segments drawn from a given point, not on it, the perpendicular line segment is the shortest.

Solution

Consider a line l on which Y and Z lies.

Now, a point X away from YZ such that $XY \perp l$ and Z is a point on line l other than Y.

In $\triangle XYZ$,

$\angle Y = 90^\circ$

So, in ΔXYZ,

$\Rightarrow \angle YXZ + \angle XZY + \angle XYZ = 180^\circ$

Putting $\angle XYZ = 90^\circ$

$\Rightarrow \angle YXZ + \angle XZY = 90^\circ$

$\Rightarrow \angle X + \angle Z = 90^\circ$

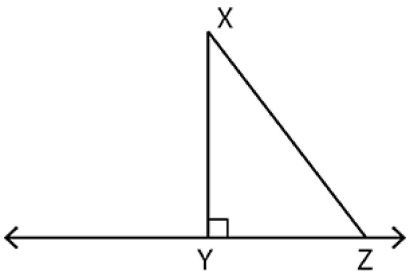
$\Rightarrow \angle Z < 90^\circ$

$\Rightarrow \angle Z < \angle Y$

$\Rightarrow XY < XZ$

(Side opposite to greater angle is greater)

XY is the shortest of all line segments from X to YZ.



#464071

Construct an angle of 45° from a horizontal line and justify the construction.

Solution

1. Draw a ray OX.

2. Cut an arc from point O of any length.

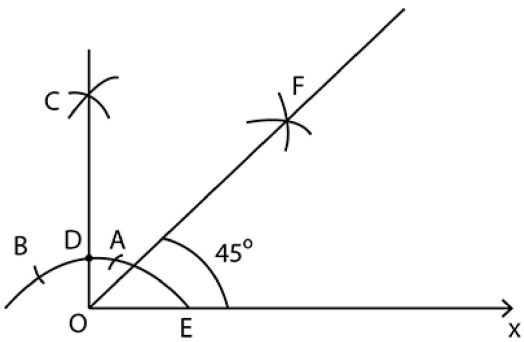
3. Cut two arcs A and B on the previous arc (which are at the angle of 60 deg and 120 deg).

4. Cut two arc from points A and B and their point of intersection is C.

5. Join $O - C$. $\angle COX$ is 90 deg.

6. Bisect $\angle COX$ through cutting two arcs from D and E, their point of intersection is F.

7. Join $F - O$, $\angle FOX is 45$$ deg.



#464082

Construct a triangle ABC in which $BC = 7cm$, $\angle B = 75^o$ and $AB + AC = 13cm$

Solution

1. Draw $BC = 7\ cm$

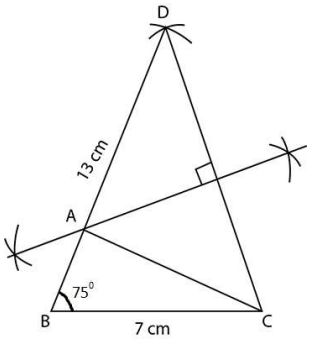
2. Draw angle 75° at B and cut an arc of $BD = 13\ cm$

3. Join CD.

4. Draw a perpendicular bisector of CD which meets BD at A.

5. Join AC.

ABC is the required triangle.



#464083

Construct a triangle ABC in which $BC = 8cm, \angle B = 45^o$ and $AB - AC = 3.5cm$

Solution

1. Draw $BC = 8\ m$

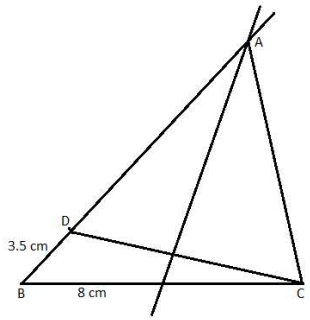
2. Draw angle 45^o at B and cut an arc of $BD = 3.5\ cm$.

3. Join CD.

4. Draw a perpendicular bisector of CD which meets BD at A.

5. Join AC.

ABC is the required triangle.



#464084

Construct a triangle PQR in which $QR = 6cm, \angle Q = 60^o$ and $PR - PQ = 2cm$

Solution

1. Draw $QR = 6\ cm$

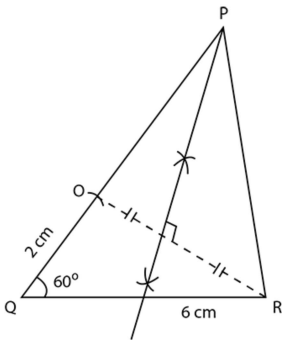
2. Draw angle 60° at B and cut an arc of $QO = 2\ cm$.

3. Join OR.

4. Draw a perpendicular bisector of OR which meets QO at P.

5. Join $P - R$.

PQR is the required triangle.



#464085

Construct a triangle PQR in which $\angle Q = 30^o$, $\angle R = 90^o$ and $PQ + QR + PR = 11cm$

Solution

Steps of Construction:

1. Draw a line segment $AB = 11\ cm\ (= PQ + QR + RP)$

2. At A, construct an angle of 30° and at B, an angle of 90°.

3. Bisect these angles. Let the bisectors of these angles intersect at a point P.

4. Draw perpendicular bisectors DE of AP to intersect AB at Q and FG of PB to intersect AB at R.

5. Join PQ and PR. Then, PQR is the required triangle.