

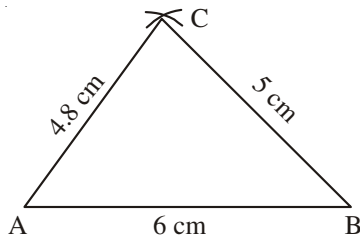
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CONSTRUCTIONS

- When 3 sides of a triangle are given :

Steps:

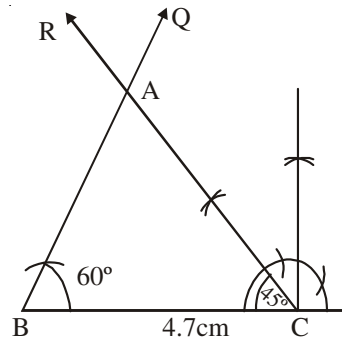
1. Draw $AB = 6\text{ cm}$.
2. With A as centre and radius 4.8 cm draw an arc.
3. With B as centre and radius 5 cm draw another arc intersecting the previous arc at C.
4. Joint A to C and B to C. ΔABC is the required triangle.



- When two angles and included side of Δ are given:

Steps:

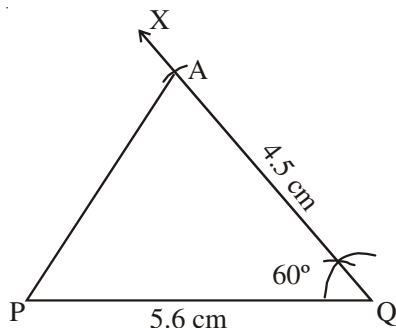
1. Draw $BC = 4.7\text{ cm}$.
2. At B construct $\angle CBQ = 60^\circ$.
3. At C construct $\angle BCR = 45^\circ$ meeting BQ at A. ΔABC is the required triangle.



- When 2 sides and included angle are given :

Steps:

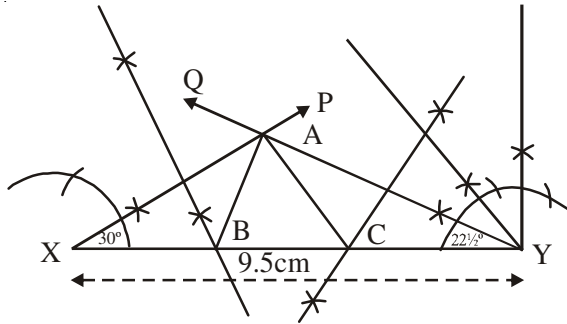
1. Draw $PQ = 5.6\text{ cm}$.
2. At Q construct an angle $\angle PQX = 60^\circ$.
3. With Q as centre and radius 4.5 cm draw an arc cutting QX at R.
4. Join P to R, ΔPQR is the required triangle.



- When perimeter and two base angles of a triangle are given :

Steps:

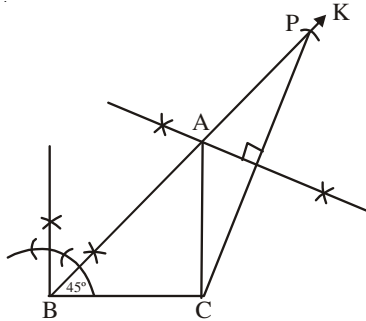
1. Draw $XY = 9.5\text{ cm}$
2. At X construct $\angle YXP = 30^\circ$ (Which is $\frac{1}{2} \times 60^\circ$).
3. At Y construct $\angle XYQ = 22\frac{1}{2}^\circ$ (which is $\frac{1}{2} \times 45^\circ$)
4. Draw right bisector of XA cutting XY at B.
5. Draw right bisector of YA cutting XY at C.
6. Join A to B and A to C. ΔABC is the required triangle.



- Construct a ΔABC when $AB + AC = 8.2$ cm, $BC = 3.6$ cm, $\angle B = 45^\circ$

Steps:

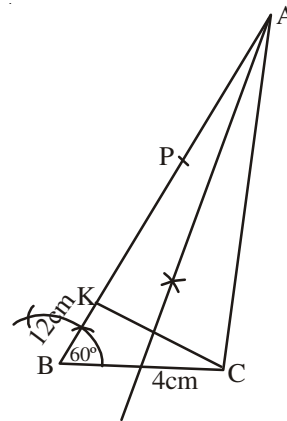
- (1) Draw $BC = 3.6$ cm
- (2) At B construct $\angle CBK = 45^\circ$.
- (3) From BK cutoff $BP = 8.2$ cm.
- (4) Join C to P and draw right bisector of CP intersecting BP at A.
- (5) Join A to C, ΔABC is the required triangle.



- Construct a ΔABC , when $BC = 4$ cm, $\angle B = 60^\circ$, $AB - AC = 1.2$ cm

Steps:

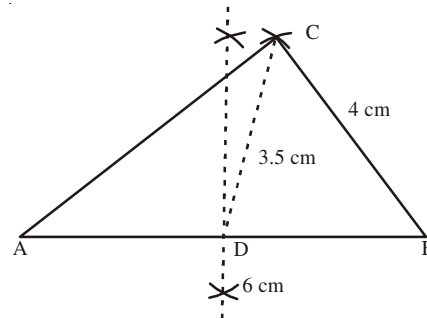
1. Draw $BC = 4$ cm.
2. Construct $\angle CBP = 60^\circ$.
3. From BP cutoff $BK = 1.2$ cm.
4. Join C to K and draw right bisector of CK intersecting BP produced at A.
5. Join A to C, ΔABC is the required triangle.



- Construct a ΔABC in which $AB = 6$ cm, $BC = 4$ cm and median $CD = 3.5$ cm.

Steps :

1. Draw $AB = 6$ cm.
2. Draw right bisector of AB meeting AB in D.
3. With D as centre and radius 3.5 cm draw an arc.
4. With B as centre and radius 4 cm draw another arc intersecting the previous arc in C.
5. Join A to C and B to C, ΔABC as the required triangle.

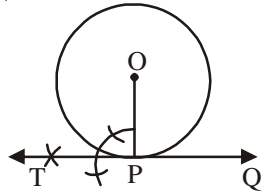


- To draw a tangent to a given circle at a given point on it using its centre :

Steps:

1. Draw a circle with centre O and a point P on it.
2. Join O to P

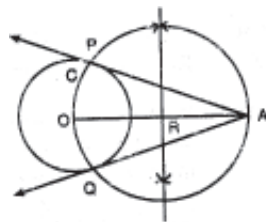
3. At P draw $PT \perp OP$.
4. Produce TP to Q, then TPQ is the required tangent.



● **To draw tangents to a given circle from a given point outside it**

Steps:

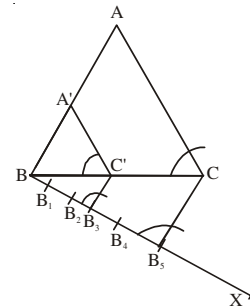
1. Draw a circle with centre O and a point P outside it.
2. Join O to A.
3. Draw the right bisector of OA. Let R be the mid point of OA.
4. With R as centre and radius as RO. Draw a circle intersecting the given circle at P and Q.
5. Join A to P and A to Q, then AP and AQ are required tangents.



● **To construct a triangle similar to a given triangle with its sides equal to $\frac{3}{5}$ of the corresponding sides of the triangle.**

Steps:

1. Let ABC be the given Δ . Draw any ray BX making an acute angle with BC on the side opposite to the vertex A.
2. Locate 5 points B_1, B_2, B_3, B_4 and B_5 on BX so that $BB_1 = B_1B_2 = B_2B_3 = B_3B_4 = B_4B_5$.
3. Join B_5 to C and draw a line through B_3 parallel to B_5C to meet BC at C' .
4. Draw a line through C parallel to CA to meet AB in A' . The $\Delta A'BC'$ is the required triangle.



CHECK YOUR PROGRESS:

1. Using a ruler and compass it is possible to construct an angle of:
 (A) 37.5° (B) 25° (C) 40° (D) 70° .
2. The construction of a ΔPQR in which $PQ = 5\text{cm}$, $\angle A = 60^\circ$ is not possible, when difference of QR and PR is equal to:
 (A) 5.2cm (B) 4.8 cm (C) 3.7cm (D) 4.5cm
3. The construction of ΔPQR is not possible, in which $PQ = 5.5\text{cm}$, $\angle Q = 45^\circ$, and $PQ + RP$ is:
 (A) 5cm (B) 6cm (C) 7cm (D) 8cm

4. The construction of a ΔABC given that $BC = 3\text{cm}$, $\angle C = 60^\circ$ is possible when difference of AB and AC is equal to:
 (A) 4cm (B) 3.5cm (C) 3.1cm (D) 2.4cm
5. Draw a line segment $BA = 8\text{cm}$, find point C on it such that $AC = \frac{3}{4} AB$.
6. Construct a triangle PQR , given that $PQ = 3.4\text{cm}$, $QR = 5.2\text{cm}$ and $PR = 7.5\text{cm}$.
7. Construct a triangle ABC , given that $AC = 5.5\text{cm}$, $AB = 3.2\text{cm}$ and $\angle A = 135^\circ$.
8. Construct a triangle PQR given that $QR = 3.2\text{cm}$, $\angle Q = 85^\circ$ and $\angle R = 60^\circ$.
9. Construct a triangle ABC in which $\angle B = 60^\circ$, $\angle C = 45^\circ$ and $AB + BC + CA = 11\text{cm}$.

STRETCH YOURSELF

1. Construct a triangle PQR in which $QR = 8\text{cm}$, $\angle Q = 45^\circ$ and $PQ - PR = 3.5\text{cm}$.
2. Construct a ΔABC in which $BC = 5\text{ cm}$, $\angle B = 60^\circ$ and $AB + AC = 7.5\text{cm}$.
3. Construct a triangle ABC in which $AB = 5\text{ cm}$, $BC = 4.2\text{ cm}$ and median $CD = 3.8\text{ cm}$.
4. Draw triangle PQR having base $QR = 6\text{cm}$, $\angle PQR = 60^\circ$ and side $PQ = 4.5\text{ cm}$.

Construct a triangle $P'QR'$ similar to ΔPQR

with scale factor $\frac{4}{5}$.

ANSWERS**CHECK YOUR PROGRESS :**

1. A
 2. A
 3. A
 4. D