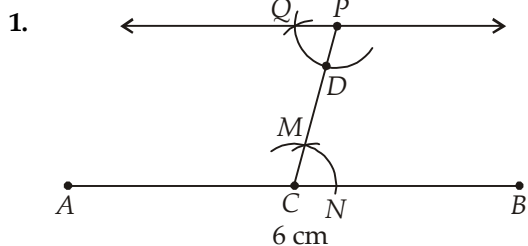
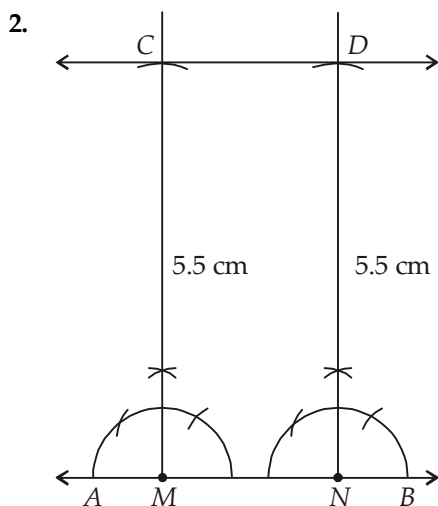


EXERCISE 15.1

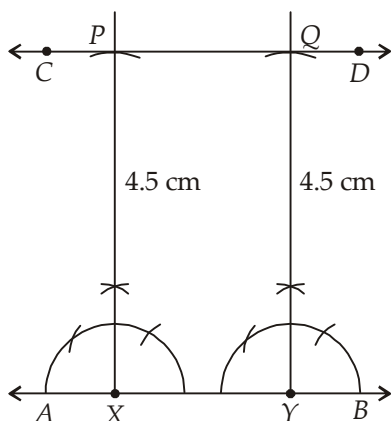


PQ is the required line parallel to line segment AB.

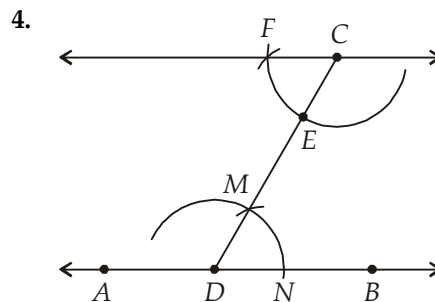


CD is the required line parallel to AB at a distance of 5.5 cm from it.

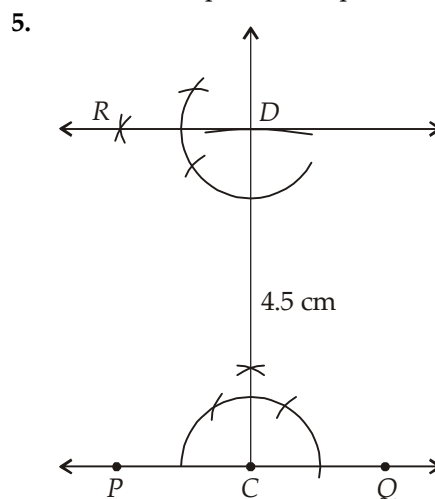
3. First we draw a line AB and then we draw a line parallel to it and at a distance of 4.5 cm from it.



AB and CD are the required parallel lines at a distance of 4.5 cm from each other.



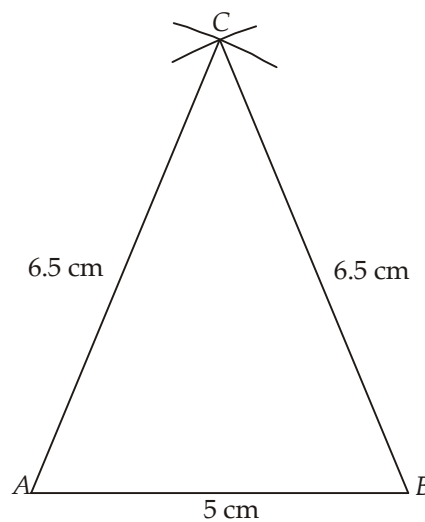
CF is the required line parallel to AB.



DR is the required line parallel to PQ.

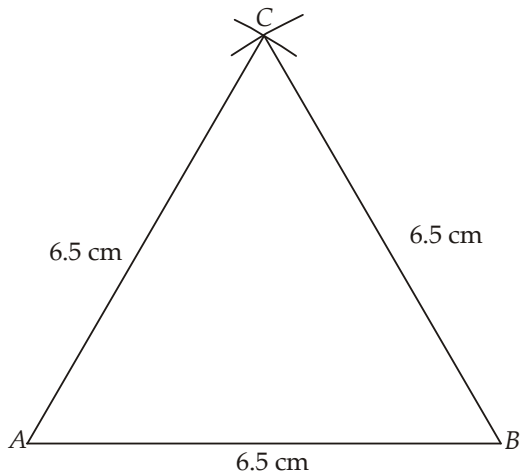
EXERCISE 15.2

1. Given that $AB = 5$ cm, $BC = 6.5$ cm, $AC = 6.5$ cm.



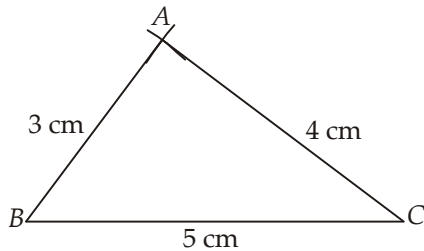
$\triangle ABC$ is the required isosceles triangle.

2. Let ABC be the required equilateral triangle in which $AB = BC = CA = 6.5$ cm.



$\triangle ABC$ is the required equilateral triangle.

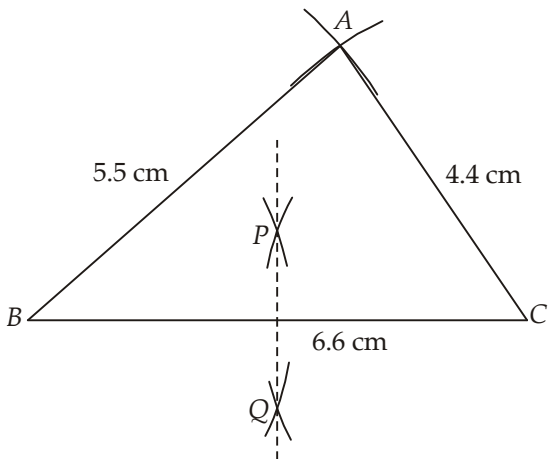
3. Given that : $AB = 3$ cm, $BC = 5$ cm, $AC = 4$ cm.



$\triangle ABC$ is the required triangle.

On measurement, $\angle A = 90^\circ$.

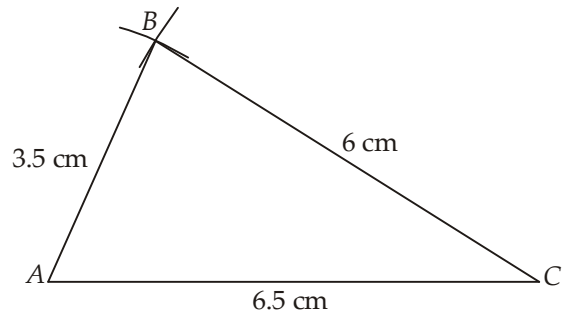
4. Let $AB = 5.5$ cm, $BC = 6.6$ cm, $AC = 4.4$ cm.



$\triangle ABC$ is the required triangle.

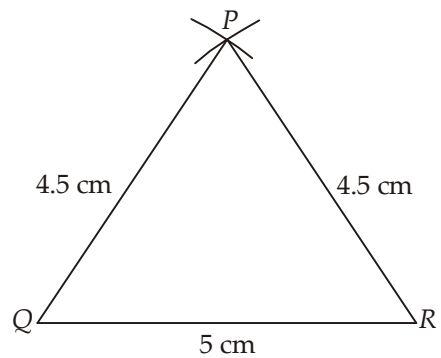
BC is the largest side. PQ is the required bisector.

5. Given that : $AB = 3.5$ cm, $BC = 6$ cm, $AC = 6.5$ cm.



$\triangle ABC$ is the required triangle. On measurement, $\angle A = 65^\circ$, $\angle B = 85^\circ$ and $\angle C = 30^\circ$

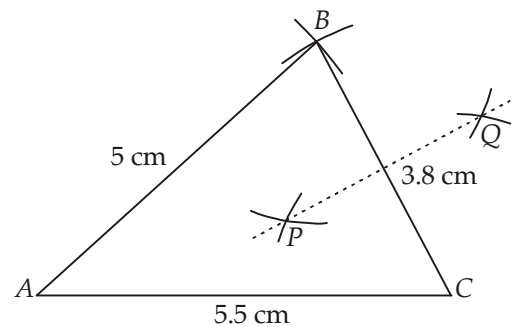
6. Given that : $PQ = 4.5$ cm, $QR = 5$ cm, $PR = 4.5$ cm.



$\triangle PQR$ is the required triangle.

In $\triangle PQR$, $PQ = PR = 4.5$ cm. So it is an isosceles triangle.

7. Given that : $AB = 5$ cm, $BC = 3.8$ cm, $AC = 5.5$ cm

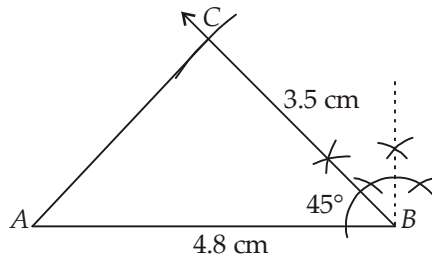


$\triangle ABC$ is the required triangle.

PQ is the required perpendicular bisector of BC .

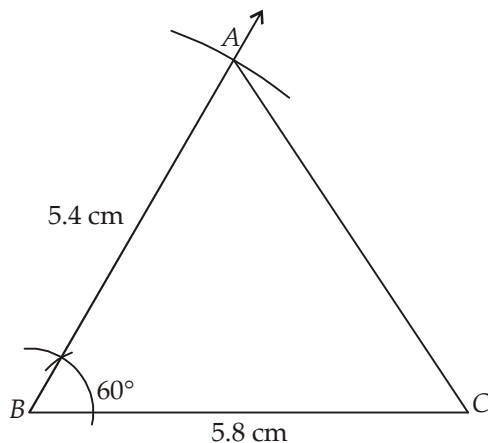
EXERCISE 15.3

1. Given that : $AB = 4.8$ cm, $BC = 3.5$ cm and $\angle ABC = 45^\circ$.



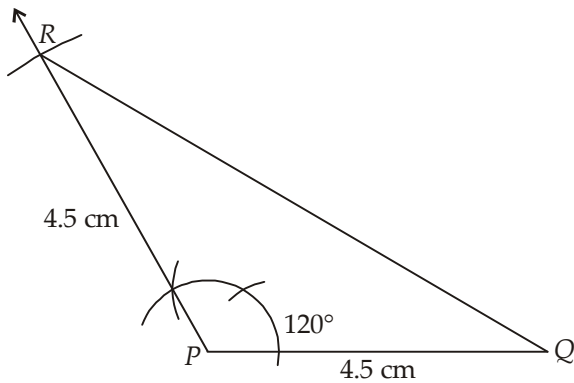
$\triangle ABC$ is the required triangle.

2. Given that : $AB = 5.4$ cm, $BC = 5.8$ cm and $\angle B = 60^\circ$.



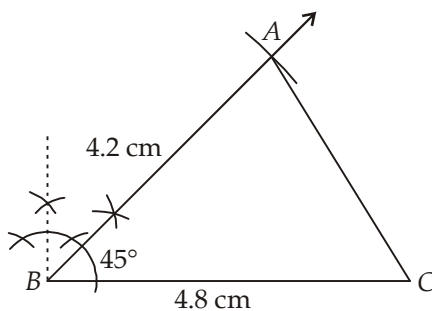
$\triangle ABC$ is the required triangle.

3. Given that : $\angle P = 120^\circ$, $PQ = PR = 4.5$ cm.



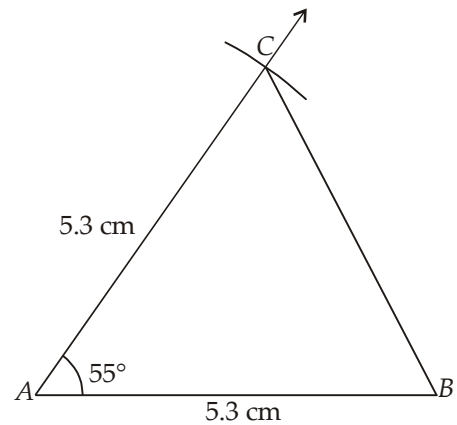
$\triangle PQR$ is the required isosceles triangle. On measurement, $\angle R = \angle Q = 30^\circ$.

4. Given that : $BC = 4.8$ cm, $AB = 4.2$ cm and $\angle B = 45^\circ$.



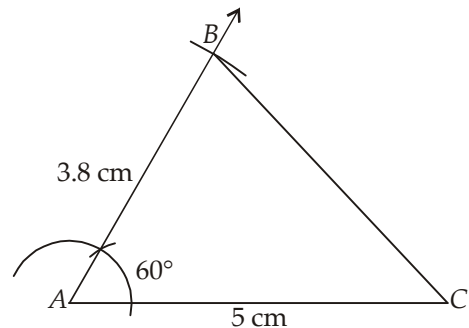
$\triangle ABC$ is the required triangle.

5. Let ABC be the required isosceles triangle in which $AB = AC = 5.3$ cm and $\angle A = 55^\circ$.



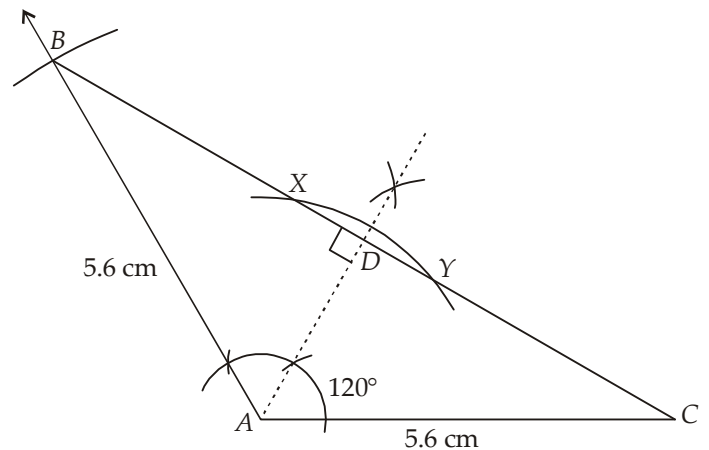
$\triangle ABC$ is the required isosceles triangle.

6. Given that : $AC = 5$ cm, $AB = 3.8$ cm and $\angle A = 60^\circ$.



$\triangle ABC$ is the required triangle.

7. Given that : $AB = AC = 5.6$ cm and $\angle A = 120^\circ$.



$\triangle ABC$ is the required isosceles triangle.

To draw perpendicular AD on BC taking A as centre and suitable radius. We draw an arc intersecting BC at X and Y Taking X and Y as centres and radius more than half of XY draw two arcs above BC intersecting at Z . Join AZ which intersects BC at D .

EXERCISE 15.4

1. Given that : $AC = 6$ cm, $\angle A = 60^\circ$ and $\angle B = 90^\circ$.

In $\triangle ABC$,

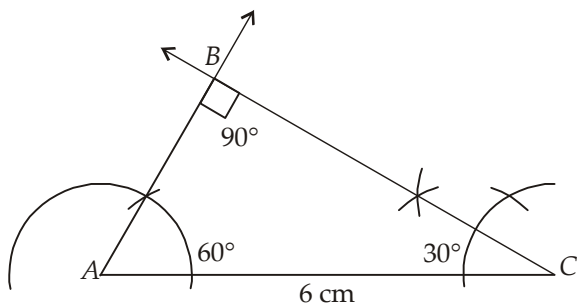
$$\angle A + \angle B + \angle C = 180^\circ \quad (\text{Angle sum property})$$

$$\Rightarrow 60^\circ + 90^\circ + \angle C = 180^\circ$$

$$\Rightarrow \angle C = 180^\circ - (60^\circ + 90^\circ)$$

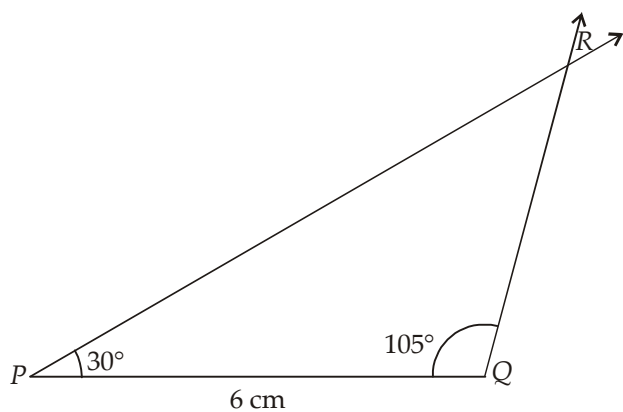
$$\Rightarrow \angle C = 180^\circ - 150^\circ$$

$$\Rightarrow \angle C = 30^\circ$$



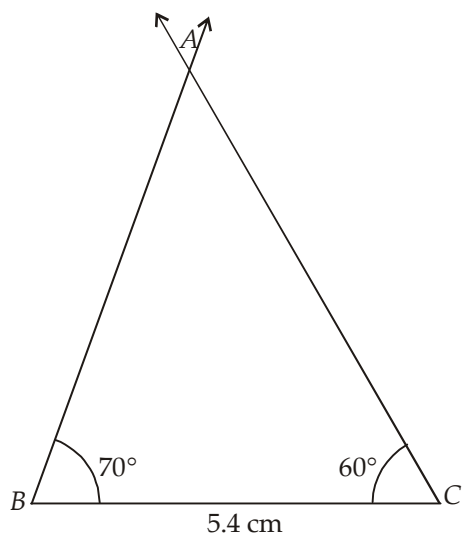
$\triangle ABC$ is the required triangle.

2. Given that : $PQ = 6$ cm, $\angle P = 30^\circ$ and $\angle Q = 105^\circ$.



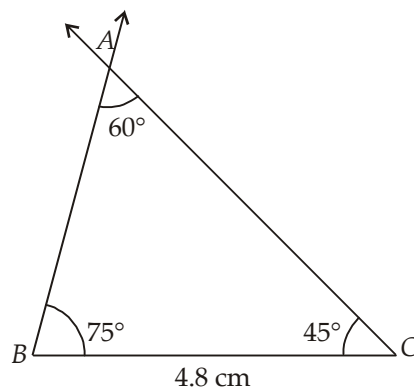
$\triangle PQR$ is the required triangle.

3. Given that : $\angle B = 70^\circ$, $\angle C = 60^\circ$ and $BC = 5.4$ cm



$\triangle ABC$ is the required triangle.

4. Given that : $BC = 4.8$ cm, $\angle B = 75^\circ$ and $\angle A = 60^\circ$.
 $\therefore \angle A + \angle B + \angle C = 180^\circ$ (\because Angle sum property)
 $\Rightarrow 60^\circ + 75^\circ + \angle C = 180^\circ$
 $\Rightarrow \angle C = 180^\circ - 135^\circ$
 $\Rightarrow \angle C = 45^\circ$



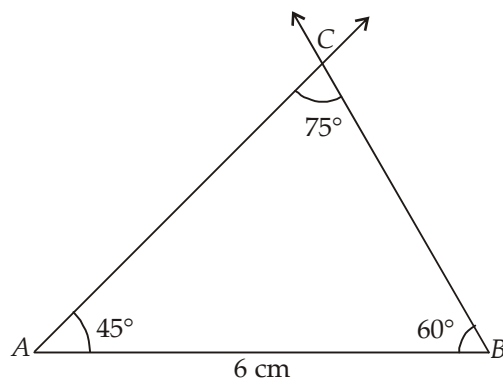
$\triangle ABC$ is the required triangle.

5. Given that : $AB = 6$ cm, $\angle A = 45^\circ$ and $\angle C = 75^\circ$.
 In $\triangle ABC$, $\angle A + \angle B + \angle C = 180^\circ$

$$\angle B = 180^\circ - (\angle A + \angle C)$$

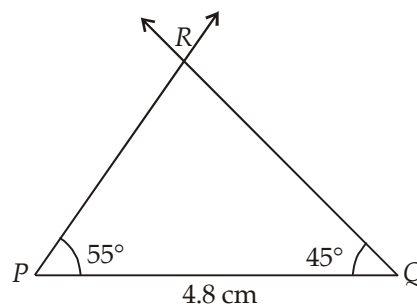
$$= 180^\circ - (45^\circ + 75^\circ)$$

$$= 180^\circ - 120^\circ = 60^\circ$$



$\triangle ABC$ is the required triangle.

6. Given that : $PQ = 4.8$ cm, $\angle P = 55^\circ$, $\angle Q = 45^\circ$.



$\triangle PQR$ is the required triangle.

In $\triangle PQR$,

$$\angle P + \angle Q + \angle R = 180^\circ$$

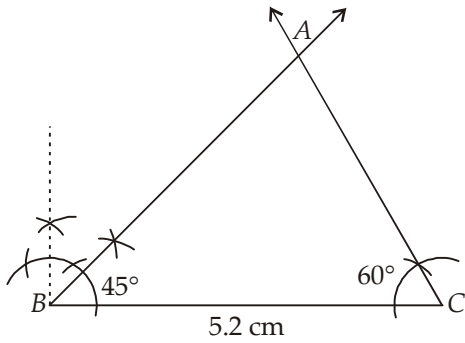
$$\Rightarrow \angle R = 180^\circ - (\angle P + \angle Q)$$

$$\Rightarrow \angle R = 180^\circ - (55^\circ + 45^\circ)$$

$$\Rightarrow \angle R = 180^\circ - 100^\circ = 80^\circ$$

We can verify it by measuring the $\angle PRQ$.

7. Base angles of a ΔABC , $\angle B = 45^\circ$, $\angle C = 60^\circ$ and $BC = 5.2$ cm.



ΔABC is the required triangle.

EXERCISE 15.5

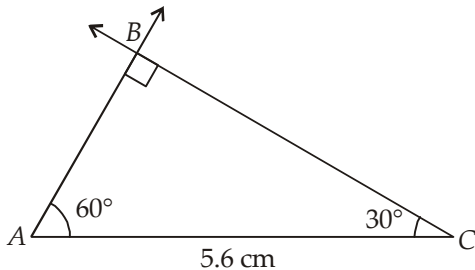
1. Let ABC be the required right angled triangle, right angle at B .

Then, hypotenuse $AC = 5.6$ cm.

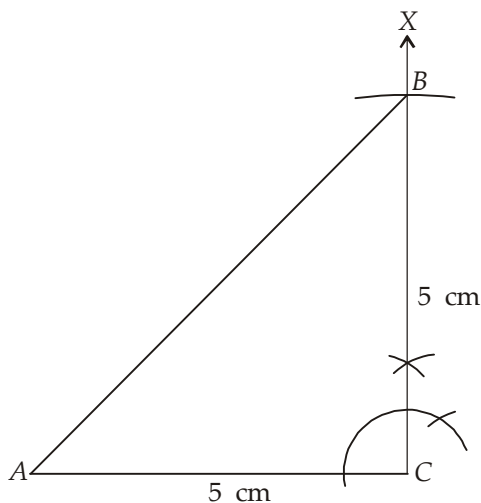
On of the acute angles (say C) is 30° .

$$\begin{aligned} \therefore \angle A &= 180^\circ - (\angle B + \angle C) \\ &= 180^\circ - (90^\circ + 30^\circ) \\ &= 180^\circ - 120^\circ = 60^\circ \end{aligned}$$

Now, we draw a triangle ABC in which $AC = 5.6$ cm, $\angle A = 60^\circ$ and $\angle C = 30^\circ$.

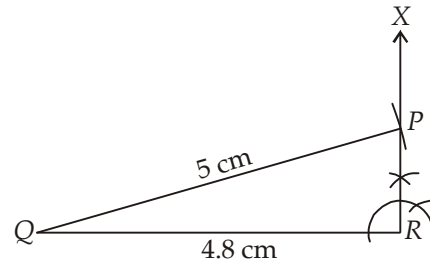


2. Given that : ΔABC is an isosceles triangle in which $AC = 5$ cm and $\angle C = 90^\circ$.
 AB is hypotenuse, $BC = AC = 5$ cm.



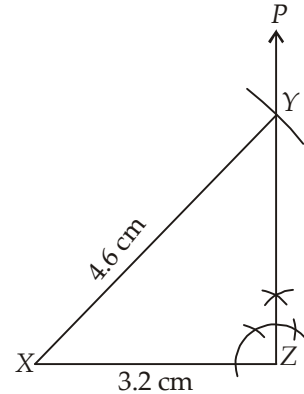
ΔABC is the required right angled isosceles triangle.

3. Given that : $PQ = 5$ cm, $QR = 4.8$ cm and $\angle R = 90^\circ$.



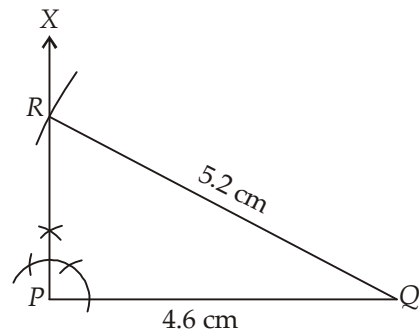
ΔPQR is the required right angled triangle.

4. Given that : $XY = 4.6$ cm, $XZ = 3.2$ cm and $\angle Z = 90^\circ$.



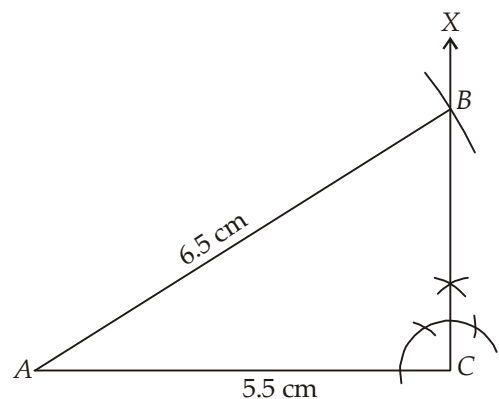
ΔXYZ is the required right angled triangle.

5. Given that : $\angle P = 90^\circ$, $QR = 5.2$ cm and $PQ = 4.6$ cm.



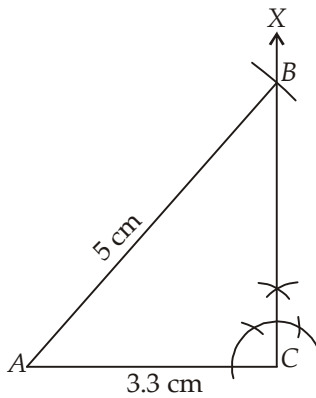
ΔPQR is the required right angled triangle.

6. Given that : $AB = 6.5$ cm, $AC = 5.5$ cm and $\angle C = 90^\circ$.



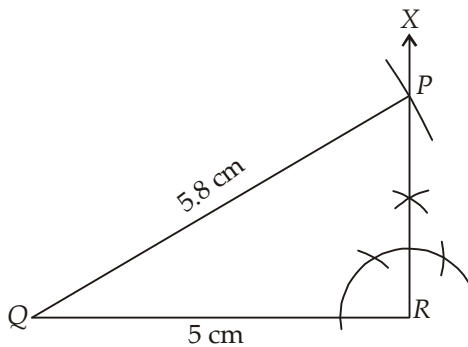
ΔABC is the required right angled triangle.

7. Given that : Hypotenuse $AB = 5$ cm, $AC = 3.3$ cm.
Also, $\angle C = 90^\circ$ as AB is hypotenuse.



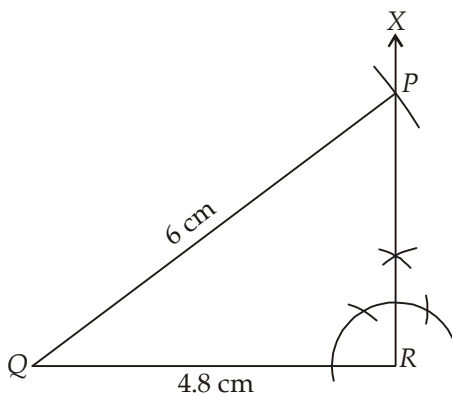
$\triangle ABC$ is the required right angled triangle.

8. Given that : $QR = 5$ cm, $\angle R = 90^\circ$ and $PQ = 5.8$ cm.



$\triangle PQR$ is the required right angled triangle.

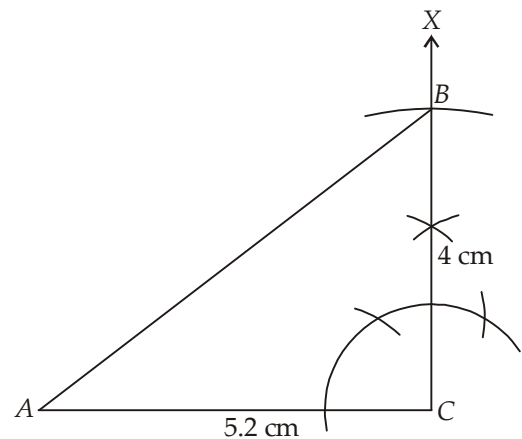
9. Given that : $QR = 4.8$ cm, $PQ = 6$ cm, $\angle R = 90^\circ$.



$\triangle PQR$ is the required triangle.

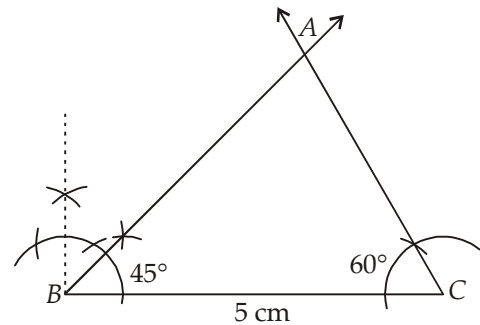
REVIEW EXERCISE

1. Given that : $AC = 5.2$ cm, $BC = 4$ cm and $\angle C = 90^\circ$.



$\triangle ABC$ is the required triangle.

2. Given that : $BC = 5$ cm, base angles $\angle B = 45^\circ$ and $\angle C = 60^\circ$.



$\triangle ABC$ is the required triangle.

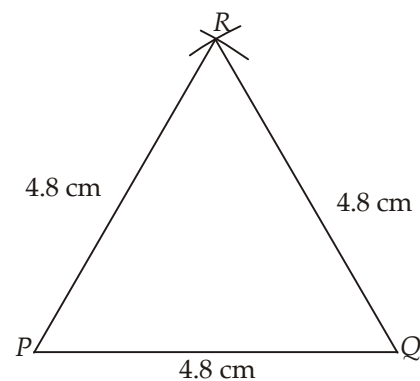
Third angle, $\angle A = 180^\circ - (\angle B + \angle C)$

$$= 180^\circ - (45^\circ + 60^\circ)$$

$$= 180^\circ - 105^\circ = 75^\circ$$

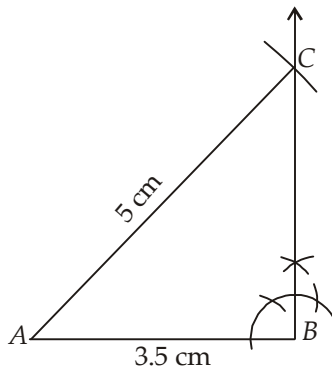
We can verify it by measurement.

3. Let $\triangle PQR$ be required equilateral triangle in which $PQ = QR = RP = 4.8$ cm.



$\triangle PQR$ is the required equilateral triangle.

4. Let ABC be required right triangle, right angled at B in which base $AB = 3.5$ cm, hypotenuse $AC = 5$ cm.



Thus, $\triangle ABC$ is the required right angled triangle.
On measurement, $BC = 3.5$ cm.

HOTS QUESTIONS

1. Let ABC be the required isosceles triangle having vertical angle A .

Vertical angle, $\angle A = 30^\circ$

Base angle, $\angle B = \angle C$

Base $BC = 3.6$ cm.

Let other two equal angles be x .

$$\therefore x + x + 30^\circ = 180^\circ \quad (\text{Angle sum property})$$

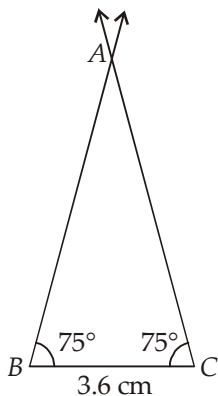
$$\Rightarrow 2x = 180^\circ - 30^\circ$$

$$\Rightarrow 2x = 150^\circ$$

$$\Rightarrow x = \frac{150^\circ}{2}$$

$$\Rightarrow x = 75^\circ$$

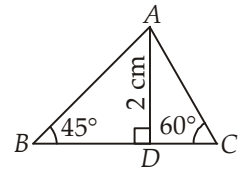
Now, $BC = 3.6$ cm, $\angle A = 30^\circ$, $\angle B = 75^\circ$ and $\angle C = 75^\circ$.



Thus, $\triangle ABC$ is the required isosceles triangle.

2. First of all, we draw a rough sketch.

Let the required triangle be ABC in which base angles $\angle B = 45^\circ$ and $\angle C = 60^\circ$, altitude $AD = 2$ cm.



Now, $\angle ADB = \angle ADC = 90^\circ$

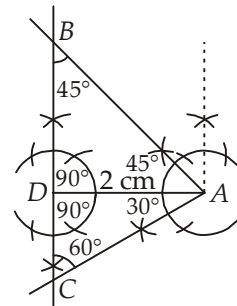
In $\triangle ADB$,

$$\begin{aligned} \angle BAD &= 180^\circ - (\angle ABD + \angle ADB) \\ &= 180^\circ - (45^\circ + 90^\circ) \\ &= 180^\circ - 135^\circ \\ &= 45^\circ \end{aligned}$$

In $\triangle ADC$,

$$\begin{aligned} \angle CAD &= 180^\circ - (\angle ACD + \angle ADC) \\ &= 180^\circ - (60^\circ + 90^\circ) \\ &= 180^\circ - 150^\circ \\ &= 30^\circ \end{aligned}$$

Now, we construct two triangles having common base $AD = 2$ cm.



$\triangle ABC$ is the required triangle whose altitude is 2 cm and base angles are 45° and 60° .