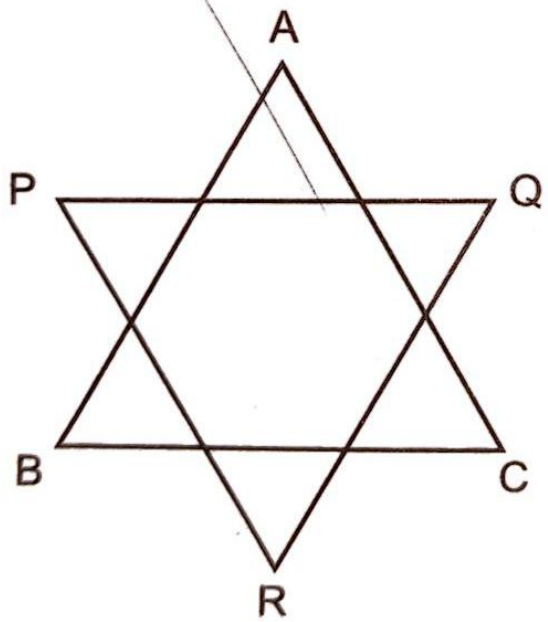
Exercise 12.5

1. Prove that the sum of three angles of a triangle is 180°.
2. In the given figure, prove that $\angle A + \angle B + \angle C + \angle P + \angle Q + \angle R = 360°$.



[**Hint:** In ΔABC,

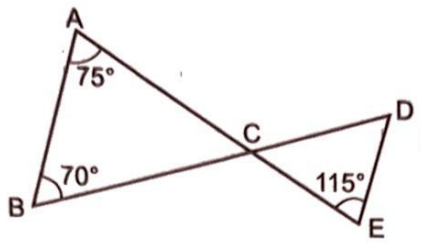
$$\angle A + \angle B + \angle C = 180°$$

and in ΔPQR,

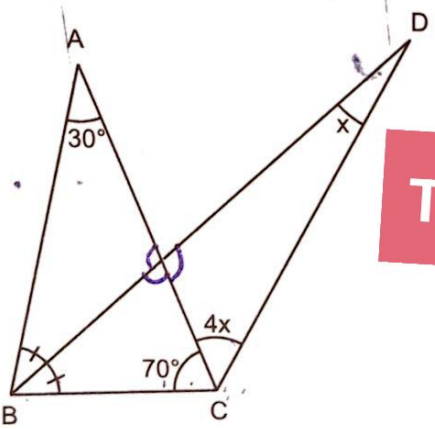
$$\angle P + \angle Q + \angle R = 180°$$

Now, add these two results.]

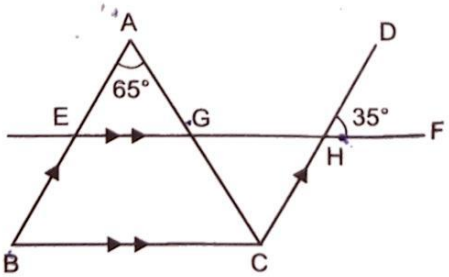
3. If the angles of a triangle are in the ratio: (*i*) 3 : 4 : 5 (*ii*) 2 : 2 : 5. Determine the three angles.
4. In the given figure, $\angle CAB = 75°$, $\angle CBA = 70°$, $\angle CED = 115°$, find $m\angle CDE$.



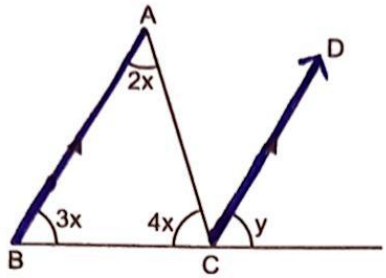
5. If the angles of a triangle are in the ratio 3 : 7 : 10, show that triangle is right angled.
6. In a ΔABC, if $\angle A + \angle B = 65°$ and $\angle B + \angle C = 140°$, calculate $\angle A$ and $\angle B$.
7. The angles of a triangle are $(2x + 10)°$, $(x + 20)°$ and $x°$. Find the value of 'x'. Assign a special name to the triangle.
8. Find x in the given figure.



9. In the given figure, AB || CD, EF || BC, $\angle BAC = 65°$, $\angle DHF = 35°$, find $\angle AGH$.

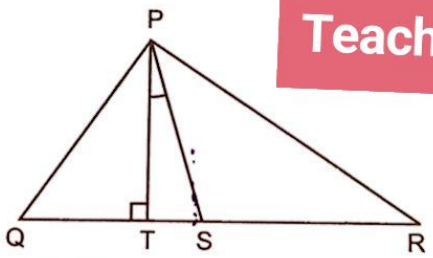


10. In the given figure, CD is parallel to AB. Calculate y.

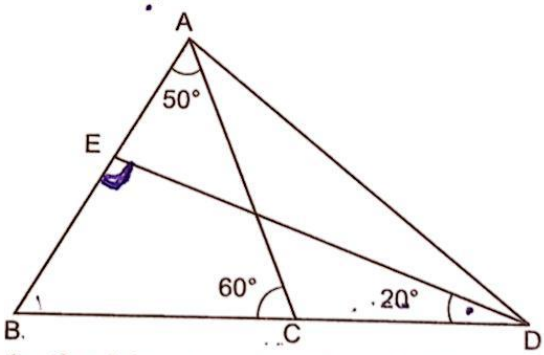


11. In the given figure, PS is the bisector of $\angle P$ and $PT \perp QR$.

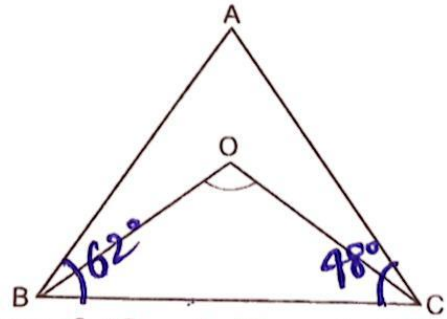
Show that $\angle TPS = \frac{1}{2}(\angle Q - \angle R)$.



12. In the given figure, $\angle BDE = 20°$, $\angle BAC = 50°$ and $\angle ACB = 60°$, find $\angle BED$.



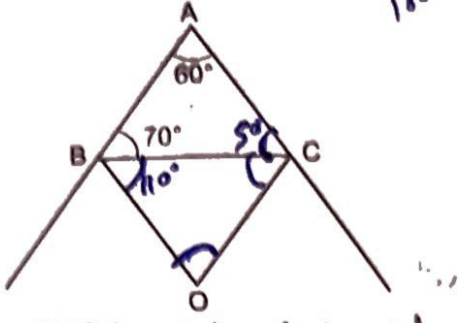
13. In ΔABC, BO is the bisector of $\angle B$ and CO is the bisector of $\angle C$. If $\angle ABC = 62°$ and $\angle ACB = 48°$, find $\angle BOC$.



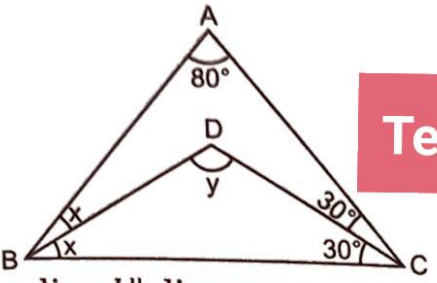
14. In a ΔPQR, bisectors of $\angle Q$ and $\angle R$ meet at M. Prove that

$$\angle QMR = 90° + \frac{1}{2}\angle P.$$

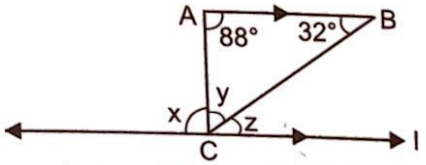
15. In the given figure, the bisectors of the exterior angles B and C of ΔABC meet at O. Given $\angle BAC = 60°$ and $\angle ABC = 70°$, find $\angle BOC$.



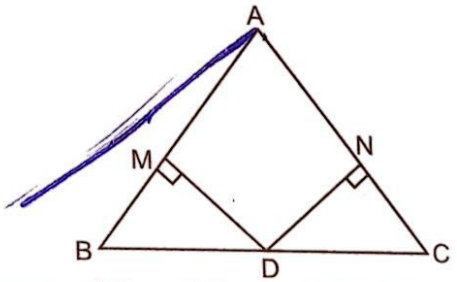
16. In the given figure, ABC is a triangle in which $\angle A = 80°$, $\angle C = 60°$, $\angle B = 2x$ and $\angle BDC = y$. BD and CD bisect $\angle B$ and $\angle C$ respectively. Calculate the values of x and y.



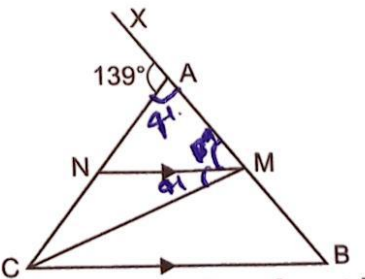
17. In the given figure, line $l \parallel$ line-segment AB. Find the values of x, y and z.



18. In ΔABC, D is any point on BC and DM $\perp$ AB, DN $\perp$ AC. Prove that $\angle BDM + \angle CDN = \angle A$.



19. In the given figure, AB = AC in ΔABC. From C, CM is so drawn that BC = CM. From M, a line MN is drawn parallel to BC to meet AC at N. Ext. $\angle CAX = 139°$. Find $\angle CMN$.



20. Prove that bisectors of the external angles at B and C of a ΔABC meet at O. Prove that $\angle BOC = 90° - \frac{1}{2}\angle A$. Find $\angle BOC$ when $A = 60°$.

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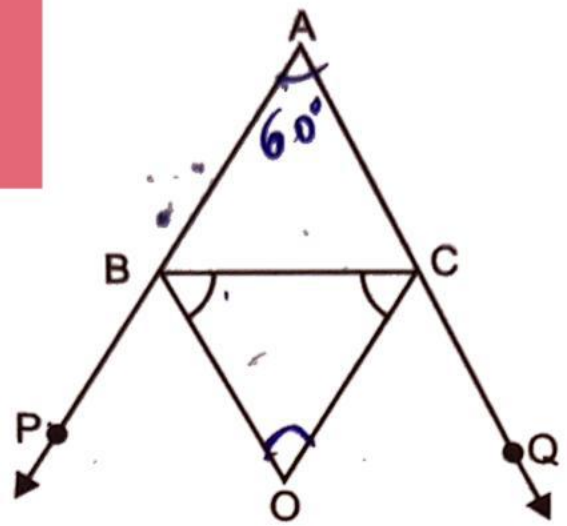

Answers

3. (*i*) 45°, 60° and 75° (*ii*) 40°, 40° and 100°

4. $\angle CDE = 30°$

6. $\angle A = 40°$; $\angle B = 25°$

7. $x = 37\frac{1}{2}$; ΔABC is an acute-angled triangle

8. $x = 14°$

9. 100°

10. 60°

12. 90°

13. 125°

15. $\angle BOC = 60°$

16. $x = 20°, y = 130°$

17. $x = 88°, y = 60°, z = 32°$

19. $\angle CMN = 41°$

20. $\angle BOC = 60°$