ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

CLASS 8

SUBJECT : Algebra and Geometry

Work sheet 11 answer key

Marks:15

Theorem 1 and Theorem 2(Pamphlet)

Date:18.4.2020

Answer all the following questions(1×15=15)

MULTIPLE-CHOICE QUESTIONS (MCQ)

Choose the correct answer in each of the following questions:

1. In a $\triangle ABC$, if $3\angle A = 4\angle B = 6\angle C$ then $A : B : C = ?$

(a) 3 : 4 : 6 (b) 4 : 3 : 2 (c) 2 : 3 : 4 (d) 6 : 4 : 3

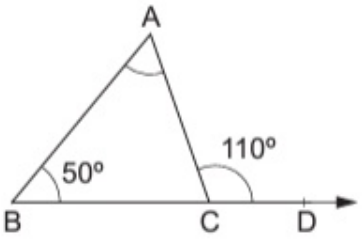
2. In a $\triangle ABC$, if $\angle A - \angle B = 42°$ and $\angle B - \angle C = 21°$ then $\angle B = ?$

(a) 32° (b) 63° (c) 53° (d) 95°

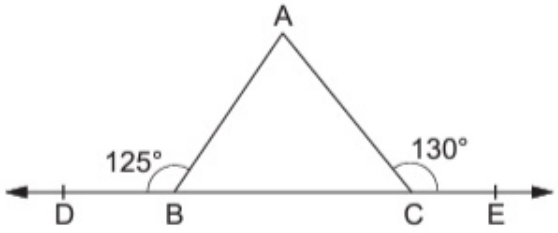
3. In a $\triangle ABC$, side BC is produced to D. If $\angle ABC = 50°$ and $\angle ACD = 110°$ then $\angle A = ?$

(a) 160° (b) 60°

(c) 80° (d) 30°

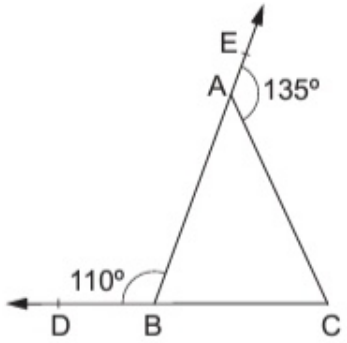


4. Side BC of $\triangle ABC$ has been produced to D on left and to E on right-hand side of BC such that $\angle ABD = 125°$ and $\angle ACE = 130°$. Then, $\angle A = ?$



(a) 50° (b) 55° (c) 65° (d) 75°

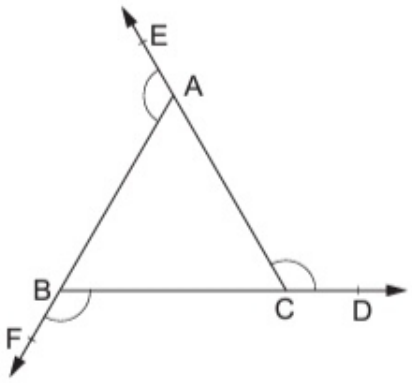
5. In the given figure, the sides CB and BA of $\triangle ABC$ have been produced to D and E respectively such that $\angle ABD = 110°$ and $\angle CAE = 135°$. Then, $\angle ACB = ?$



(a) 65° (b) 45°

(c) 55° (d) 35°

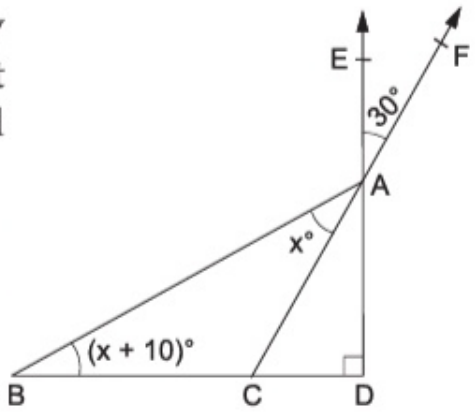
6. The sides BC, CA and AB of $\triangle ABC$ have been produced to D, E and F respectively. $\angle BAE + \angle CBF + \angle ACD = ?$



(a) 240° (b) 300°

(c) 320° (d) 360°

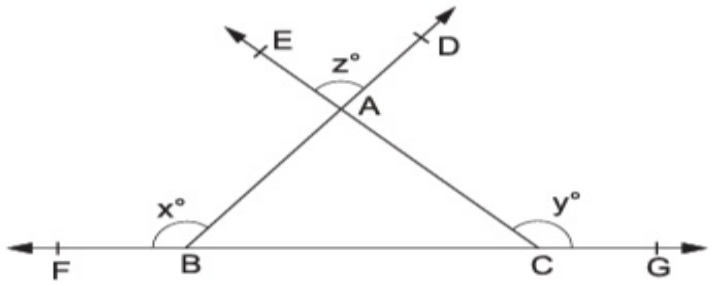
7. In the given figure, $EAD \perp BCD$. Ray FAC cuts ray EAD at a point A such that $\angle EAF = 30°$. Also, in $\triangle BAC$, $\angle BAC = x°$ and $\angle ABC = (x + 10)°$. Then, the value of x is



(a) 20 (b) 25

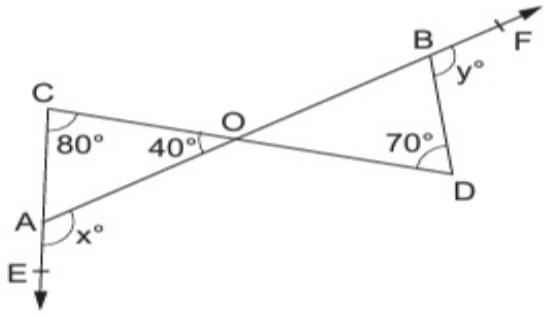
(c) 30 (d) 35

8. In the given figure, two rays BD and CE intersect at a point A. The side BC of $\triangle ABC$ have been produced on both sides to points F and G respectively. If $\angle ABF = x°$, $\angle ACG = y°$ and $\angle DAE = z°$ then $z = ?$



(a) $x + y - 180$ (b) $x + y + 180$ (c) $180 - (x + y)$ (d) $x + y + 360°$

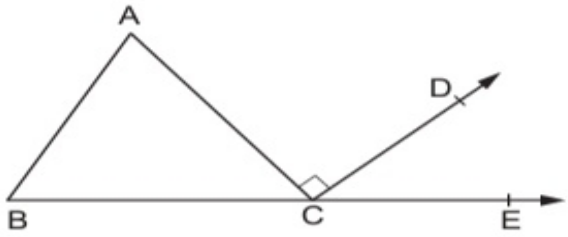
9. In the given figure, lines AB and CD intersect at a point O. The sides CA and OB have been produced to E and F respectively such that $\angle OAE = x°$ and $\angle DBF = y°$.



If $\angle OCA = 80°$, $\angle COA = 40°$ and $\angle BDO = 70°$ then $x° + y° = ?$

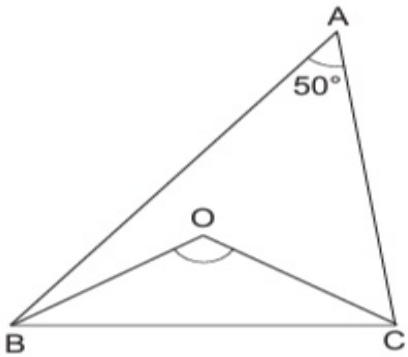
(a) 190° (b) 230° (c) 210° (d) 270°

10. In a $\triangle ABC$, it is given that $\angle A : \angle B : \angle C = 3 : 2 : 1$ and $\angle ACD = 90°$. If BC is produced to E then $\angle ECD = ?$



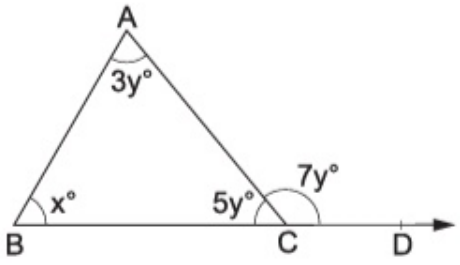
(a) 60°
(b) 50°
(c) 40°
(d) 25°

11. In the given figure, BO and CO are the bisectors of $\angle B$ and $\angle C$ respectively. If $\angle A = 50°$ then $\angle BOC = ?$



(a) 130° (b) 100°
(c) 115° (d) 120°

12. In the given figure, side BC of $\triangle ABC$ has been produced to a point D. If $\angle A = 3y°$, $\angle B = x°$, $\angle C = 5y°$ and $\angle CBD = 7y°$. Then, the value of x is



(a) 60 (b) 50

(c) 45 (d) 35

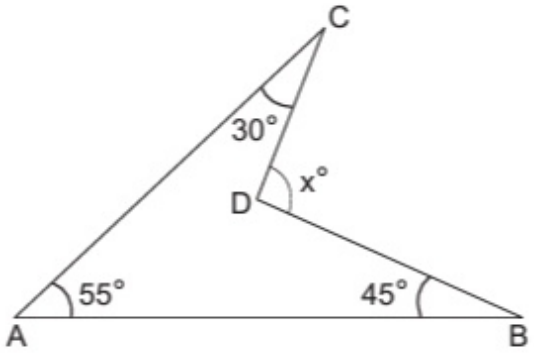
13. If one angle of a triangle is greater than the sum of the other two, then the triangle is .....angled

(a) obtuse (b)right

(c) acute (d)none of these

14.

Calculate the value of x in the given figure.

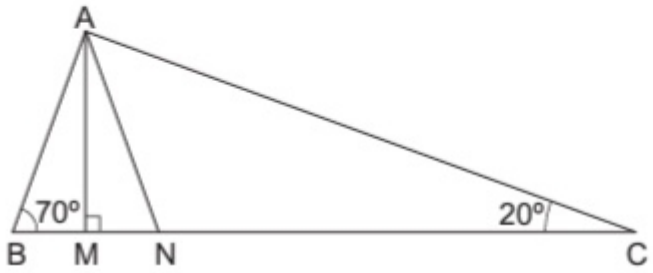


(a) 130° (b)90°

(c) 120° (d) 180°

15.

In the given figure, $AM \perp BC$ and AN is the bisector of $\angle A$. If $\angle ABC = 70°$ and $\angle ACB = 20°$, find $\angle MAN$.



(a) 25° (b) 65°

(c) 75° (d) 125° **Indranil Ghosh**

ANSWERS (MCQ) 1. (b) 2. (c) 3. (b) 4. (d) 5. (a) 6. (d) 7. (b) 8. (a) 9. (b) 10. (a) 11. (c) 12. (a) 13.(a) 14.(a) 15.(a)

1. Let $3A = 4B = 6C = k$. Then, $A = \frac{k}{3}, B = \frac{k}{4}, C = \frac{k}{6}$.

   $\therefore \quad A : B : C = \frac{k}{3} : \frac{k}{4} : \frac{k}{6} = 4 : 3 : 2.$

2. $\angle A = \angle B + 42°$ and $\angle C = (\angle B - 21°)$.

   $A + B + C = 180° \Rightarrow (B + 42) + B + (B - 21) = 180$

   $\Rightarrow 3B = 159 \Rightarrow B = 53°.$

3. Ext. $\angle ACD = \angle BAC + \angle ABC \Rightarrow x + 50 = 110 \Rightarrow x = 60.$

4. $\angle ABC = (180° - 125°) = 55°$ and $\angle ACB = (180° - 130°) = 50°$.

   $\angle A + \angle B + \angle C = 180° \Rightarrow \angle A + 55° + 50° = 180°$

   $\Rightarrow \angle A = (180° - 105°) = 75°.$

5. $\angle BAC = (180° - 135°) = 45°$ and $\angle ABD = (180° - 110°) = 70°$.

   $\angle A + \angle B + \angle C = 180° \Rightarrow 45° + 70° + \angle ACB = 180° \Rightarrow \angle ACB = 65°.$

7. $\angle CAD = \angle EAF = 30°$ [vert. opp. $\measuredangle$s].

   $\angle ACD = 180° - (30° + 90°) = 60° \Rightarrow x + (x + 10) = 60 \Rightarrow x = 25.$

8. $\angle BAC = \angle EAD = z°, \angle ABC = (180° - x°), \angle BCA = (180° - y°)$.

   $\angle BAC + \angle ABC + \angle BCA = 180°$

   $\Rightarrow \quad z + (180 - x) + (180 - y) = 180 \Rightarrow z = (x + y) - 180.$

9. Ext. $\angle OAE = \angle OCA + \angle COA \Rightarrow x° = (80° + 40°) = 120°.$

   $\angle BOD = \angle COA = 40°$ (vert. opp. $\measuredangle$)

   Ext. $\angle DBF = \angle BOD + \angle BDO = (40° + 70°) = 110° \Rightarrow y° = 110°.$

   $\therefore \quad x° + y° = (120° + 110°) = 230°.$

10. $\angle A + \angle B + \angle C = 180° \Rightarrow 3x + 2x + x = 180$

    $\Rightarrow 6x = 180 \Rightarrow x = 30.$

    $\therefore \quad \angle A = 90°, \angle B = 60°$ and $\angle C = 30°$.

    $\angle ACE = \angle A + \angle B \Rightarrow 90° + \angle ECD = 90° + 60° \Rightarrow \angle ECD = 60°.$

11. $\angle B + \angle C = (180^\circ - \angle A) = (180^\circ - 150^\circ) = 130^\circ.$

$$\frac{1}{2}\angle B + \frac{1}{2}\angle C = \left(\frac{1}{2} \times 130^\circ\right) = 65^\circ.$$

$$\frac{1}{2}\angle B + \frac{1}{2}\angle C + \angle BOC = 180^\circ \Rightarrow 65^\circ + \angle BOC = 180^\circ \Rightarrow \angle BOC = 115^\circ.$$

12. $5y^\circ + 7y^\circ = 180^\circ \Rightarrow 12y^\circ = 180^\circ \Rightarrow y = 15.$

$3y + x + 5y = 180 \Rightarrow 8y + x = 180 \Rightarrow 120 + x = 180 \Rightarrow x = 60.$

14.

$30^\circ + \alpha_1 = \alpha, 45^\circ + \alpha_2 = \beta.$

Adding, $(30^\circ + 45^\circ) + (\alpha_1 + \alpha_2) = \alpha + \beta$

$\Rightarrow \quad 75^\circ + 55^\circ = x^\circ \Rightarrow x = 130.$

15.

. $\angle A + \angle B + \angle C = 180^\circ \Rightarrow \angle A + 70^\circ + 20^\circ = 180^\circ \Rightarrow \angle A = 90^\circ.$

In $\triangle ABM, \angle ABM + \angle BMA + \angle BAM = 180^\circ.$

$\therefore \quad 70^\circ + 90^\circ + \angle BAM = 180^\circ \Rightarrow \angle BAM = 20^\circ.$

$$\angle BAN = \frac{1}{2}\angle A = 45^\circ \Rightarrow \angle BAM + \angle MAN = 45^\circ$$

$$\Rightarrow \angle MAN = (45^\circ - 20^\circ) = 25^\circ.$$