# ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

**CLASS 8**

**SUBJECT :Algebra and Geometry** **Work sheet 10 answer key**

**Marks:15** **CONGRUENCY AND INEQUALITIES IN TRIANGLES**

**Date:17.4.2020**

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

## MULTIPLE-CHOICE QUESTIONS (MCQ)

*Choose the correct answer in each of the following:*

**1.** Which of the following is not a criterion for congruence of triangles?

(a) SSA (b) SAS (c) ASA (d) SSS

**2.** If $AB = QR$, $BC = RP$ and $CA = PQ$ then which of the following holds?

(a) $\triangle ABC \cong \triangle PQR$ (b) $\triangle CBA \cong \triangle PQR$

(c) $\triangle CAB \cong \triangle PQR$ (d) $\triangle BCA \cong \triangle PQR$

**3.** If $\triangle ABC \cong \triangle PQR$ then which of the following is not true?

(a) $BC = PQ$ (b) $AC = PR$ (c) $BC = QR$ (d) $AB = PQ$

**4.** In $\triangle ABC$, $AB = AC$ and $\angle B = 50°$. Then, $\angle A$ = ?

(a) 40° (b) 50° (c) 80° (d) 130°

**5.** In $\triangle ABC$, $BC = AB$ and $\angle B = 80°$. Then, $\angle A$ = ?

(a) 50° (b) 40° (c) 100° (d) 80°

**6.** In $\triangle ABC$, $\angle C = \angle A$, $BC = 4$ cm and $AC = 5$ cm. Then, $AB$ = ?

(a) 4 cm (b) 5 cm (c) 8 cm (d) 2.5 cm

**7.** Two sides of a triangle are of length 4 cm and 2.5 cm. The length of the third side of the triangle cannot be

(a) 6 cm (b) 6.5 cm (c) 5.5 cm (d) 6.3 cm

8. In $\triangle ABC$, if $\angle C > \angle B$, then

(a) $BC > AC$ (b) $AB > AC$ (c) $AB < AC$ (d) $BC < AC$

9. It is given that $\triangle ABC \cong \triangle FDE$ in which $AB = 5$ cm, $\angle B = 40°$, $\angle A = 80°$ and $FD = 5$ cm. Then, which of the following is true?

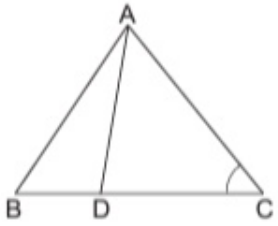
(a) $\angle D = 60°$ (b) $\angle E = 60°$ (c) $\angle F = 60°$ (d) $\angle D = 80°$

10. In $\triangle ABC$, $\angle A = 40°$ and $\angle B = 60°$. Then, the longest side of $\triangle ABC$ is

(a) $BC$ (b) $AC$

(c) $AB$ (d) cannot be determined

11. In the given figure, $AB > AC$. Then, which of the following is true?



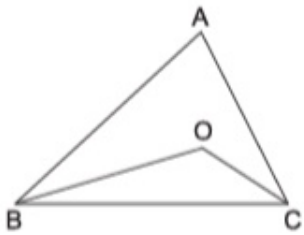

(a) $AB < AD$

(b) $AB = AD$

(c) $AB > AD$

(d) Cannot be determined

12. In the given figure, $AB > AC$. If $BO$ and $CO$ are the bisectors of $\angle B$ and $\angle C$ respectively then

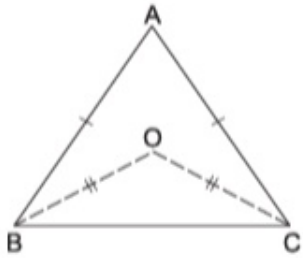



(a) $OB = OC$

(b) $OB > OC$

(c) $OB < OC$

13. In the given figure, $AB = AC$ and $OB = OC$. Then, $\angle ABO : \angle ACO = ?$




(a) 1 : 1

(b) 2 : 1

(c) 1 : 2

(d) none of these

14. If the altitudes from two vertices of a triangle to the opposite sides are equal then the triangle is

(a) equilateral (b) isosceles

(c) scalene (d) right angled

15. In $\triangle ABC$ and $\triangle DEF$, it is given that $AB = DE$ and $BC = EF$. In order that $\triangle ABC \cong \triangle DEF$, we must have

(a) $\angle A = \angle D$ (b) $\angle B = \angle E$ (c) $\angle C = \angle F$ (d) none of these

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

1. SSA is not a criterion for congruence of triangles.

2. Clearly, $\begin{matrix} A & B & C \\ \downarrow & \downarrow & \downarrow \\ Q & R & P \end{matrix}$

   So, $\triangle CAB \cong \triangle PQR$.

3. $\triangle ABC \cong \triangle PQR \Rightarrow BC = QR$.

   $\therefore$ $BC = PQ$ is not true.

4. $AB = AC \Rightarrow \angle C = \angle B = 50°$.

   So, $\angle A + 50° + 50° = 180° \Rightarrow \angle A = 80°$.

5. $BC = AB \Rightarrow \angle A = \angle C = x°$ (say).

   Then, $x + 80 + x = 180 \Rightarrow 2x = 100 \Rightarrow x = 50$.

6. $\angle C = \angle A \Rightarrow AB = BC = 4$ cm.

7. Sum of two sides must be greater than the third side.

   So, the third side cannot be 6.5 cm.

8. $\angle C > \angle B \Rightarrow AB > AC$.

9. Given, $\triangle ABC \cong \triangle FDE$.

   $AB = FD = 5$ cm, $\angle B = 40°$ and $\angle A = 80°$.

   $\therefore$ $\angle C = 180° - (80° + 40°) = 60°$.

   So, we must have $\angle E = \angle C = 60°$.

10. $\angle C = 180° - (40° + 60°) = 80°$. So, the longest side is $AB$.

11. $AB > AC \Rightarrow \angle ACB > \angle ABC$.

    Ext. $\angle ADB > \angle ACD \Rightarrow \angle ADB > \angle ACB > \angle ABC$

    $\Rightarrow \angle ADB > \angle ABD \Rightarrow AB > AD$.

12. $AB > AC \Rightarrow \angle C > \angle B \Rightarrow \frac{1}{2}\angle C > \frac{1}{2}\angle B$

    $\Rightarrow \angle OCB > \angle OBC \Rightarrow OB > OC$.

13. Join $OA$.

    In $\triangle OAB$ and $\triangle OAC$, we have

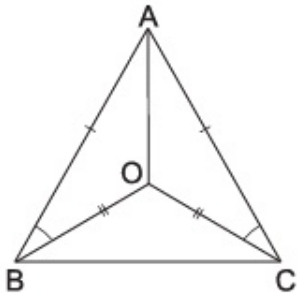
    $AB = AC$ (given),

    $OB = OC$ (given)

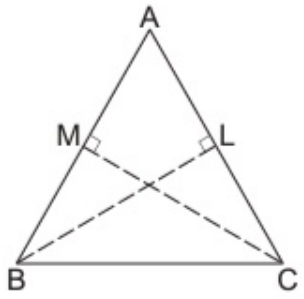
    and $OA = OA$.

    $\therefore$ $\triangle OAB \cong \triangle OAC \Rightarrow \angle ABO = \angle ACO$.

    $\therefore$ $\angle ABO : \angle ACO = 1 : 1$.



14. A $\triangle ABC$ is given in which $BL \perp AC$ and $CM \perp AB$ such that $BL = CM$. Then, we have to prove that $AB = AC$.




In $\triangle ABL$ and $\triangle ACM$, we have:

$BL = CM$ (given),

$\angle BAL = \angle CAM$ (common),

$\angle ALB = \angle AMC$ (each $90°$)

$\triangle ABL \cong \triangle ACM$ and hence $AB = AC$.

$\triangle ABC$ is isosceles.

15. For congruence, we must have $\angle B = \angle E$.

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