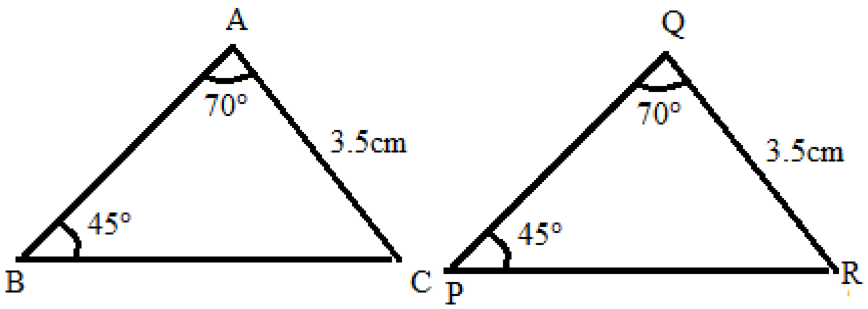
Department of Mathematics

INDIAN SCHOOL AL WADI AL KABIR

Class IX, Mathematics

Worksheet-Triangles

<table>
<tr><th>Q. No.</th><th colspan="8">Questions of 1 Mark each.</th></tr>
<tr><td>1.</td><td colspan="8">Which of the following is not a criterion for congruence of triangles?</td></tr>
<tr><td></td><td>(A)</td><td>SAS</td><td>(B)</td><td>ASA</td><td>(C)</td><td>SSA</td><td>(D)</td><td>SSS</td></tr>
<tr><td>2.</td><td colspan="8">If AB=QR, BC=PR and CA=PQ, then</td></tr>
<tr><td></td><td>(A)</td><td>$\Delta ABC \cong \Delta PQR$</td><td>(B)</td><td>$\Delta CBA \cong \Delta PRQ$</td><td>(C)</td><td>$\Delta BAC \cong \Delta RPQ$</td><td>(D)</td><td>$\Delta PQR \cong \Delta BAC$</td></tr>
<tr><td>3.</td><td colspan="8">In triangles ABC and PQR, AB=AC, $\angle C = \angle P$ and $\angle B = \angle Q$. The two triangles are:</td></tr>
<tr><td></td><td>(A)</td><td>Isosceles but not congruent</td><td>(B)</td><td>Isosceles and congruent</td><td>(C)</td><td>Congruent but not isosceles</td><td>(D)</td><td>Neither congruent nor isosceles.</td></tr>
<tr><td>4.</td><td colspan="8">Observe the given triangles and choose the right answer.

</td></tr>
<tr><td></td><td>(A)</td><td>$\Delta ABC \cong \Delta QPR$</td><td>(B)</td><td>$\Delta ABC \cong \Delta PQR$</td><td>(C)</td><td>$\Delta ABC \cong \Delta PRQ$</td><td>(D)</td><td>$\Delta BAC \cong \Delta RPQ$</td></tr>
<tr><td>5.</td><td colspan="8">It is given that $\Delta ABC \cong \Delta FDE$ and AB= 5cm, $\angle B = 40°$ and $\angle A = 80°$. Then which of the following is true?</td></tr>
<tr><td></td><td>(A)</td><td>DF=5cm, $\angle B = 60°$</td><td>(B)</td><td>DE=5cm, $\angle E = 60°$</td><td>(C)</td><td>DF=5cm, $\angle E = 60°$</td><td>(D)</td><td>DE=5cm, $\angle D = 40°$</td></tr>
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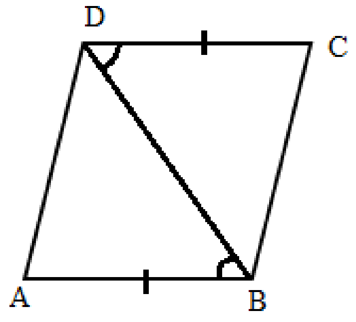
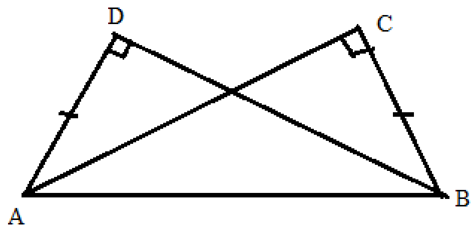
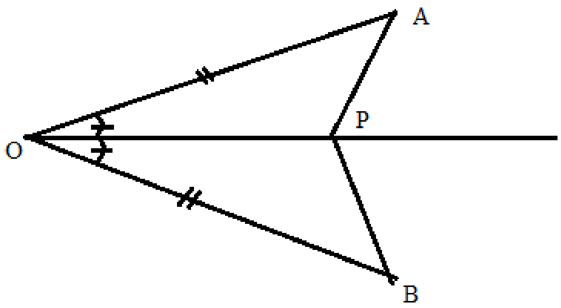
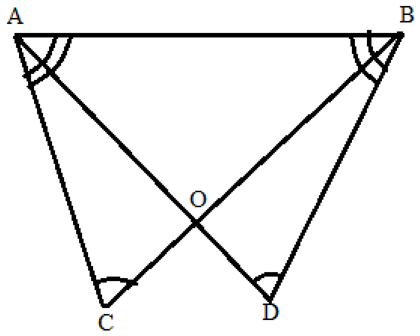
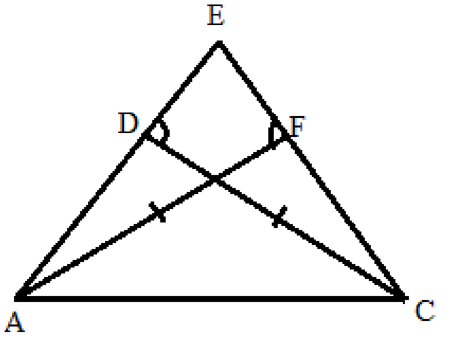
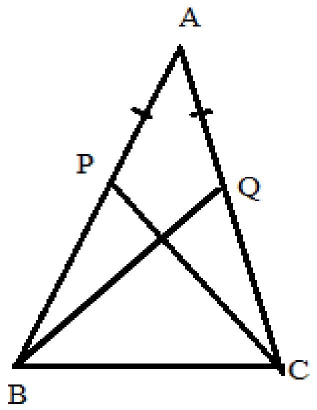
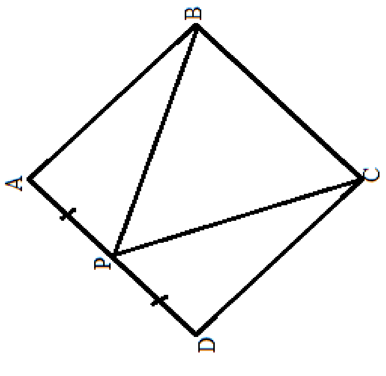
6.	In figure, if AB=DC, ∠ABD =∠CDB, which congruence rule would you apply to prove ΔABD ≅ΔCDB? 
7.	In the given figure, prove that ΔABD ≅ΔBAC? 
8.	Given ΔOAP ≅ΔOBP in the figure below. Prove criteria by which the triangles are congruent. 
9.	In the given figure, ∠ACB=∠BDA, ∠ABD =∠BAC. Prove that ΔAOB is isosceles. 

10.	In the figure, if AF = CD, ∠AFE =∠CDE, Prove that EF = ED. 
	Questions of 2 marks each
11.	Prove that the angle opposite to equal sides of a triangle are equal.
12.	ABC is an isosceles triangle with AB = AC. P and Q are points on AB and AC respectively such that AP= AQ, Prove that ∠ACP =∠ABQ, and CP =BQ. 
13.	In the figure below, ABCD is a square and P is the mid-point of AD. BP and CP are joined. Prove that ∠PCB=∠PBC. 

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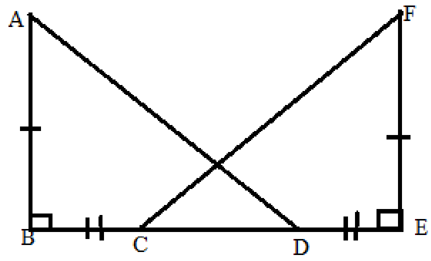
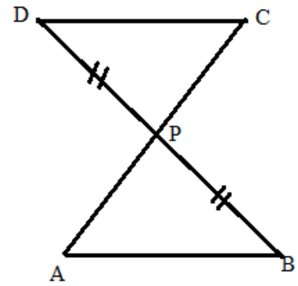
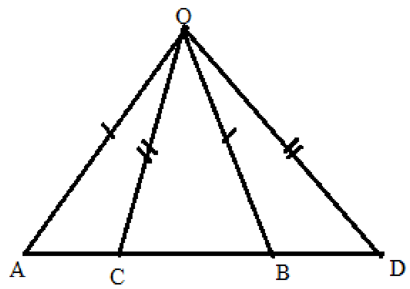
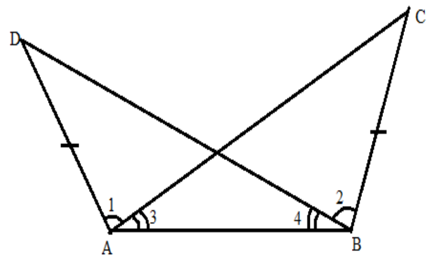
<tr><td>14.</td><td>In figure, AB=EF, BC=ED, AB $\perp$ BD, EF$\perp$ EC, Prove that $\Delta ABD \cong \Delta FEC$.

</td></tr>
<tr><td>15.</td><td>In the given figure, if AB$\parallel$ DC and P is the mid-point of BD, Prove that P is also the mid-point of AC.

</td></tr>
<tr><td colspan="2">Questions of 3 marks each</td></tr>
<tr><td>16.</td><td>In the figure, OA=OB, OC=OD and $\angle AOB = \angle COD$. Prove that $AC = BD$.

</td></tr>
<tr><td>17.</td><td>In figure, $\Delta ABC \cong \Delta ABD$ are such that AD=BC, $\angle 1 = \angle 2$ and $\angle 3 = \angle 4$. Prove that $BD = AC$.

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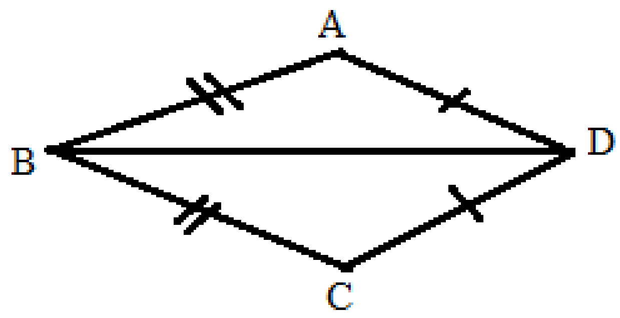
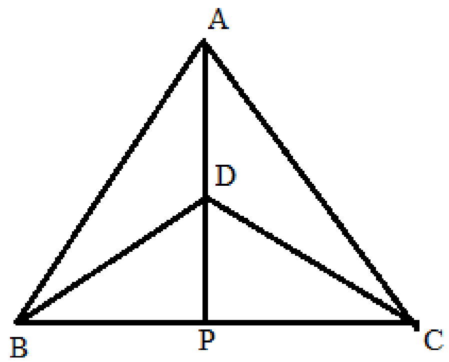
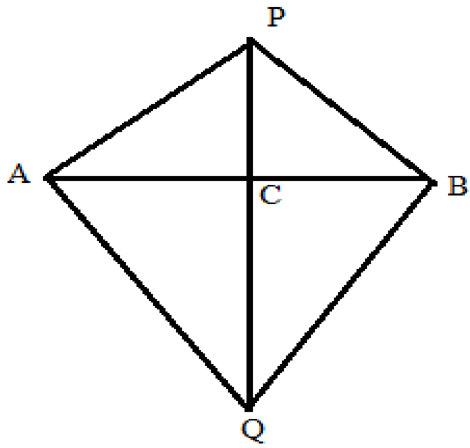
18.	In fig. AD= CD and AB = CB. State three pairs of equal parts in ΔABD≅ΔCBD. Is ΔABD≅ΔCBD? Why or why not? Does BD bisect ∠ABC? Give reasons. 
Questions of 4 marks each	
19.	CASE STUDY: A triangular based agricultural field ABC is divided by the farmer in four parts. In two parts of his field he wants to grow sugarcane and other two parts he wants to grow wheat. He wants to grow wheat on the field division exactly which are exactly same in shape and size, the same he wants to do sugarcane.  If ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side BC. AD is extended to intersect BC at P. With reference to the figure given, answer the following questions. i)Prove that ΔABD ≅ΔACD. ii) Prove that ΔAPB ≅ΔAPC.

20.	AB is a line segment. P and Q are points on opposite sides of AB such that each of them is equidistant from the points A and B. Show that the line PQ is the perpendicular bisector of AB. 

Answers

1	C	**2**	B	**3**	A	**4**	QA
5	C	**6**	SAS	**7**	AD=BC, AB=BA $\angle D=\angle C=90°$ By RHS	**8**	OA=OB, $\angle 1=\angle 2$, OP=OP BY SAS
9	$\angle C=\angle D$, AB=AB $\angle ABD=\angle BAC$ By AAS	**10**	AF=CD, $\angle AFE=\angle CDE$ $\angle E=\angle E$ By AAS	**11**	$\angle 1=\angle 2$, AD=AD, AB=AC By SAS	**12**	AB=AC,AP=AQ, $\angle A=\angle A$ By SAS
13	AP=DP,AB=DC $\angle A=\angle D=90°$ By SAS	**14**	AB=EF $\angle B=\angle E=90°$ BC=ED BC+CD=ED+CD BD=EC, By SAS	**15**	BP=DP, $\angle 1=\angle 2$, $\angle 3=\angle 4$ By AAS	16	OA=OB, OC=OD, $\angle AOB=\angle COD$ $\angle AOC=\angle BOD$ By SAS
17	By SAS	**18**	By SSS	**19**	By SAS	**20**	To be proved by using SSS and SAS