



MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

CONGRUENCE

All Questions

1. Explain the concept of congruence of figures with the help of certain examples.

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2. Fill in the blanks: Two line segments are congruent if.. Two angles are congruent if

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3. Fill in the blanks: Two square are congruent if

Two rectangles are congruent if

Two circles are congruent if

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4. In Fig.6, $\angle POQ \cong \angle ROS$, can we say that $\angle POR \cong \angle QOS$

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5. In Fig.7, $a = b = c$, name the angle which is congruent to $\angle AOC$

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6. Is it correct to say that any two right angles are congruent? Give reasons to justify your answer.

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7. In Fig,8, $\angle AOC \cong \angle PYR$ and $\angle BOC \cong \angle QYR$. Name the angle which is congruent to $\angle AOB$.



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8. Which of the following statements are true and which are false; All squares are congruent. If two squares have equal areas, they are congruent. If two rectangles have equal areas, they are congruent. If two triangles have equal areas, they are congruent.



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9. Without drawing the triangles, state the correspondence between the sides and the angles of the following pairs of congruent triangles:

$ABC \cong PQR$ (b) $ABC \cong QRP$



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10. In the following pairs of triangle (Fig.10), by applying SSS condition, state which are congruent. State the result in symbolic form:



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11. Which of the following pairs of triangles are congruent? If they are congruent, write out the pairs of equal angles.

$$ABC: AB = 3\text{ cm}, BC = 4\text{ cm}, CA = 2\text{ cm}$$

$$DEF: DE = 2\text{ cm}, EF = 3\text{ cm and } FD = 4\text{ cm}$$

$$PQR: PQ = 17\text{ cm}, QR = 15\text{ cm}, PR = 18\text{ cm}$$

$$DEF: DE = 18\text{ cm}, EF = 17\text{ cm}, DF = 15\text{ cm} .$$



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12. In Fig.11, it is given that $AB = CD$ and $AD = BC$. Prove that $ADC \cong CBA$.



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13. In the following pairs of triangle (Fig. 12 to 15), the lengths of the sides are indicated along sides. By applying SSS condition, determine which are congruent. State the result in symbolic form.

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14. In Fig,16, $AD = DC$ and $AB = BC$ Is $\triangle ABD \cong \triangle CBD$? State the three parts of matching pairs you have used to answer (i).

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15. In Fig,17, $AB = DC$ and $BC = AD$. Is $\triangle ABC \cong \triangle CDA$? What congruence condition have you used? You have used some fact, not given in the question, what is that?

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16. In $\triangle PQR \cong \triangle EFD$, Which side of $\triangle PQR$ equals ED ? Which angle of $\triangle PQR$ equals $\angle E$?

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17. Triangles ABC and PQR are both isosceles with $AB = AC$ and $PQ = PR$ respectively. If also, $AB = PQ$ and $BC = QR$, are the two triangles congruent? Which condition do you use? If $\angle B = 50^\circ$, what is the measure of $\angle R$?

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18. ABC and DBC are both isosceles triangles on a common base BC such that A and D lie on the same side of BC . Are triangles ADB and ADC congruent? Which condition do you use? If $\angle BAC = 40^\circ$ and $\angle BDC = 100^\circ$; then find $\angle ADB$

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19. $\triangle ABC$ and $\triangle ABD$ are on a common base AB , and $AC = BD$ and $BC = AD$ as shown in Fig. 18. Which of the following statements is true? $\triangle ABC \cong \triangle ABD$ $\triangle ABC \cong \triangle ADB$ $\triangle ABC \cong \triangle BAD$

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20. In Fig.19, $\triangle ABC$ is isosceles with $AB = AC$, D is the mid-point of base BC . Is $\triangle ADB \cong \triangle ADC$? State the three pairs of matching parts you use to arrive at your answer.

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21. In figure.20, $\triangle ABC$ is isosceles with $AB = AC$. State if $\triangle ABC \cong \triangle ACB$. If yes, state three relations that you use to arrive at your answer.

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22. Triangles ABC and DBC have side BC common, $AB = BD$ and $AC = CD$. Are the two triangles congruent? State in symbolic form. Which congruence condition do you use? Does $\triangle ABD$ equal $\triangle ACD$? Why or why not?

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23. In each of the following pairs of triangles the measure of some parts are indicated along. Side. By the application of SAS congruence condition, state which are congruent. State the result in symbolic form.

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24. Which of the following pairs of triangles are congruent?

$ABC: AB = 2 \text{ cm}, AC = 4 \text{ cm}, \angle A = 40^\circ; XYZ: XZ = YZ = 4, \angle Z =$

$PQR: PQ = 5 \text{ cm}, PR = 6 \text{ cm}, \angle P = 55^\circ; DEF: DE = 6 \text{ cm}, EF = 5$

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25. Show that in an isosceles triangle, angles opposite to equal sides are equal.

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26. Show that the bisector of vertical angle of an isosceles triangle bisects the base at right angles.

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27. In ABC , $\angle A = 100^\circ$ and $AB = AC$. Find $\angle B$ and $\angle C$.

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28. In Fig.26, $AB = AC$ and $\angle ACD = 120^\circ$. Find $\angle A$.

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29. Prove that measure of each of an equilateral triangle is 60°

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30. By applying SAS congruence condition, state which of the following pairs of triangle are congruent. State the result in symbolic form

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31. State the condition by which the following pairs of triangles are congruent.

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32. In figure, line segments AB and CD bisect each other at O. Which of the following statements is true? $\triangle AOC \cong \triangle DOB$ $\triangle AOC \cong \triangle BOD$
 $\triangle AOC \cong \triangle ODB$

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33. Line-segments AB and CD bisect each other at O . AC and BD are joined forming triangles AOC and BOD . State the three equality relations between the parts of the two triangles that are given or otherwise known. Are the two triangles congruent? State in symbolic form, which congruence condition do you use?

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34. ΔABC is isosceles with $AB = AC$. Line segment AD bisects $\angle A$ and meets the base BC at D . Is $\Delta ADB \cong \Delta ADC$? State the three pairs of matching parts used to answer (i). Is it true to say that $BD = DC$?

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35. In Fig.31, $AB = AD$ and $\angle BAC = \angle DAC$ State in symbolic form the congruence of two triangles ABC and ADC that is true. Complete each of the following, so as to make it true: $\triangle ABC \cong \triangle ACD$ Line segment bisects ___ and _____

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36. In figure, $AB \parallel DC$ and $AB = DC$. Is $\triangle ACD \cong \triangle CAB$? State the three pairs of matching parts used to answer (i). Which angle is equal to $\angle CAD$? Does it follow from (iii) that $AD \parallel BC$?

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37. In each of the following pairs of triangle given in Fig.33, the measure of some parts are indicated along side. By applying ASA congruence condition, state which are congruent. State the answer in symbolic form.

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38. Which of the following pairs of triangle are congruent?

$ABC: AB = 10 \text{ cm}, \angle A = 40^\circ, \angle B = 55^\circ; XYZ: XY = 10, \angle Y = 40^\circ,$

$PQR: PR = 5 \text{ cm}, \angle P = 37^\circ, \angle R = 64^\circ; DEF: DE = 5 \text{ cm}, \angle D = 37^\circ$



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39. Which of the following pairs of triangle are congruent by ASA condition?



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40. In Fig.37, AD bisects $\angle A$ and $AD \perp BC$. Is $\triangle ADB \cong \triangle ADC$?

State the three pairs of matching parts you have used in (i) Is it true to say that $BD = DC$?



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41. Draw any triangle ABC . Use ASA condition to construct another triangle congruent to it.

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42. In $\triangle ABC$, it is known that $\angle B = \angle C$. Imagine you have another copy of $\triangle ABC$. Is $\triangle ABC \cong \triangle ACB$? State the three pairs of matching parts you have used to answer (i). Is it true to say that $AB = AC$?

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43. In Fig.38, AX bisects $\angle BAC$ as well as $\angle BDC$. State the three facts needed to ensure that $\triangle ABD \cong \triangle ACD$

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44. In Fig.39, $AO = OB$ and $\angle A = \angle B$. Is $\triangle AOC \cong \triangle BOD$? State the matching pair you have used, which is not given in the question. Is it true to say that $\angle ACO = \angle BDO$?

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45. In each of the following pairs of right triangles, the measure of some parts are indicated along side. State by the application of RHS congruence condition which are congruent. State each result in symbolic form.

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46. In Fig.42, $PL \perp OB$ and $PM \perp OA$ such that $PL = PM$. Is $\triangle PMO$? Give reason in support of your answer.

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47. If $\triangle ABC$ is an isosceles triangle such that $AB = AC$, then altitude AD from A on BC bisects BC (Fig.43).

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48. In Fig.44, it is given that $LM = MN$, $QM = MR$, $ML \perp PQ$ and $MN \perp PR$. Prove that $PQ = PR$.

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49. AD , BE and CF , the altitudes of ABC are equal. Prove that ABC is an equilateral triangle.

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50. In each of the following pairs of right triangles, the measures of some parts are indicated along side. State by the application of RHS

congruence conditions which are congruent, State each result in symbolic form. (Fig.46)

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51. $\triangle ABC$ is isosceles with $AB = AC$. AD is the altitude from A on BC . Is $\triangle ABD \cong \triangle ACD$? State the pairs of matching parts you have used to answer (i). Is it true to say that $BD = DC$?

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52. $\triangle ABC$ is isosceles with $AB = AC$. Also, $AD \perp BC$ meeting BC in D . Are the two triangles ABD and ACD congruent? State in symbolic form. Which congruence condition do you use? Which side of $\triangle ADC$ equals BD ? Which angle of $\triangle ADC$ equals $\angle B$?

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53. Draw a right triangle ABC . Use RHS condition to construct another triangle congruent to it.



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54. In Fig.47, BD and CE are altitudes of $\triangle ABC$ and $BD = CE$. Is $\triangle BCD \cong \triangle CBE$? State the three pairs or matching parts you have used to answer (i)



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