MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

UNDERSTANDING PHASE-III (SPECIAL TYPES OF QUADRILATERALS)

Others

1. In a parallelogram the sum of any two adjacent angles is 180^0.

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2. In a parallelogram, two adjacent angles are supplementary.

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3. Two adjacent angles of a parallelogram are equal. What is the measure of each?

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4. In a parallelogram $ABCD$, $\angle D = 115^0$, determine the measure of $\angle A \; and \; \angle B$.

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5. Two adjacent angles of a parallelogram are as $2:3$. Find the measures of all the angles.

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6. In Figure, $ABCD$ is a parallelogram in which $\angle DAB = 75^0$, $\angle DBC = 60^0$. Calculate $\angle CDB \, and \, \angle ADB$.

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7. In a parallelogram $ABCD$, the bisectors of $\angle A \, and \, \angle B$ meet at O. Find $\angle AOB$.

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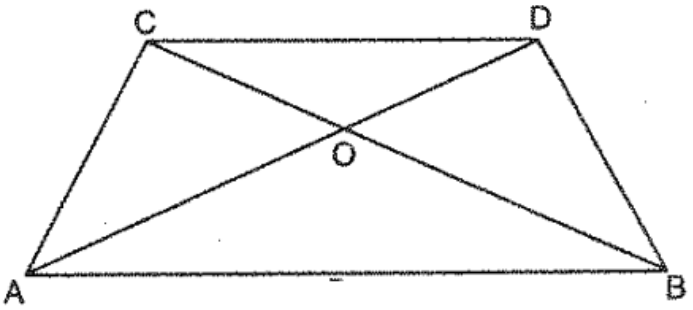
8. Given below is a parallelogram $ABCD$. Complete each statement along with the definition or property used.

(i) $AD =$

(ii) $\angle DCB =$

(iii) $OC =$

(iv) $\angle DAB + \angle CDA =$



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9. Two opposite angles of a parallelogram are $(3x-2)^{\circ} and\ (50-x)^{\circ}$. Find the measure of each angle of the parallelogram.

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10. If an angle of a parallelogram is two-third of its adjacent angle, find the angles of the parallelogram.

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11. The measure of one angle of a parallelogram is 70^{0}. What are the measures of the remaining angles?

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12. Two adjacent angles of a parallelogram are as 1:2. Find the measures of all the angles of the parallelogram.

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13. In a parallelogram $ABCD$, $\angle D = 135^0$, determine the measure of $\angle A$ and $\angle B$.

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14. $ABCD$ is a parallelogram in which $\angle A = 70^\circ$. Compute $\angle B$, $\angle C$ and $\angle D$.

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15. The sum of two opposite angles of a parallelogram is 130°. Find all the angles of the parallelogram.

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16. All the angles of a quadrilateral are equal to each other. Find the measure of each. Is the quadrilateral a parallelogram? What special type of parallelogram is it?

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17. Two adjacent sides of a parallelogram is 150cm. One of its sides is greater than the other by 25cm. Find the length of the sides of the parallelogram.

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18. The perimeter of a parallelogram is 150cm. One of its sides is greater than the other by 25cm. Find the length of the sides of the parallelogram.

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19. The shorter side of a parallelogram is 4.8cm and the longer side is half as much again as the shorter side. Find the perimeter of the parallelogram.

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20. Two adjacent angles of a parallelogram are $(3x-4)^{\circ} and\ (3x+10)^{\circ}$. Find the angles of the

parallelogram.

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21. In a parallelogram $ABCD$, the diagonals bisect each other at O. If $\angle ABC = 30^0$, $\angle BDC = 10^0 and \angle CAB = 70^0$, Find: $\angle DAB$, $\angle ADC$, $\angle BCD$, $\angle AOD$, $\angle DOC$, $\angle BOC$, $\angle AOB$, $\angle ACD$, $\angle CAB$, $\angle ADB$

Given that

$\angle ABC = 30^2, \angle ABC = \angle ADC = 30^0$

[We know that measure of opposite angles are equal in a parallelogram]

$\angle BDC = 10^0$

$\angle CAB = 70^0$

$\angle BDA = \angle ADB = \angle ADC - \angle BDC$

$30^2 - 10^2 = 20^2$

$\angle DAB = 180^0 - 30^0 = 150^0$

$\angle ADB = \angle DBC = 20^0$ (alternate angles)

$\angle BCD = \angle DAB = 150^0$

[we know, opposite angles are equal in a parallelogram]

$\angle DBA = \angle BDC = 10^0$

[we know, Alternate interior angles are equal]

In ΔABC

$\angle CAB + \angle ABC + \angle BCA = 180^0$

[since, sum of all angles of a triangle is 180^0]

$70^0 + 30^0 + \angle BCA = 180^0$

$\angle BCA = 180^0 - 100^0 = 80^0$

$\angle DAB = \angle DAC + \angle CAB = 70^0 + 80^0 = 150^0$

$\angle BCD = 150^0$ (opposite angle of the parallelogram)

$\angle DCA = \angle CAB = 70^0$

In $\Delta DOC \angle BDC + \angle ACD + \angle DOC = 180^0$

[since, sum of all angles of a triangle is 180^0]

$10^0 + 70^0 + \angle DOC = 180^0$

$\angle DOC = 180^0 - 80^0$

$\angle ACB = 80^0$

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22. The angle between the altitudes of a parallelogram, through the same vertex of an obtuse angle of the parallelogram is 60^0. Find the angles of parallelogram.

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23. Diagonals of a parallelogram $ABCD$ intersect at $O\dot{A}L \, and \, CM$ are perpendiculars to BD such that

$L\ and\ M$ lie on BD . IS $AL = CM$? why or why not?

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24. Point $E\ and\ F$ lie on diagonals AC of a parallelogram $ABCD$ such that $AnE = CF$. What type of quadrilateral is $BFDE$? From the given figure we see that $BFDE$is also a parallelogram.

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25. In a parallelogram $ABCD,\ AB = 10cm,\ AD = 6cm$. The bisector of $\angle A$ meets DC in $E,\ AE\ and\ BC$ produced meet at F. Find the length `C Foot

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26. In Figure, $ABCD$ is a rhombus with $\angle ABC = 56^0$. Determine $\angle ACD$.

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27. One of the diagonals of a rhombus is equal to one of its sides. Find the angles of the rhombus.

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28. $ABCD$ is a rhombus in which the altitude from D to side AB bisects AB. Find the angles of the rhombus.

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29. Construct a rhombus whose diagonals are 10cm and 8cm.

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30. Which of the following statements are true for a rhombus?

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31. Fill in the blanks, in each of the following, so as to make the statement true: (i)A rhombus is a parallelogram in which.... (ii)A square is a rhombus in which.... (iii)A rhombus has all its sides of ..... length. (iv)The diagonals of a rhombus..... each other at... angles. (v)If the diagonals of a parallelogram bisect each other at right angles, then it is a....

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32. The diagonals of a parallelogram are not perpendicular. Is it a rhombus? Why or why not?

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33. The diagonals of a quadrilateral are perpendicular to each other. Is such a quadrilateral always a rhombus? If your answer is 'No', draw a figure to justify your answer.

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34. $ABCD$ is a rhombus. If $\angle ACB = 40^\circ$, find $\angle ADB$.

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35. If the diagonals of a rhombus are 12cm and 16cm, find the length of each side.

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36. Construct a rhombus whose diagonals are of length 10cm and 6cm.

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37. Draw a rhombus, having each side of length 3.5cm and one of the angle as 40^0.

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38. One side of a rhombus is a length of 4cm and the length of an altitude is 3.2cm. Draw the rhombus.

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39. Draw a rhombus, having each side of length 3.5cm and one of the angle as 40^0.

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40. One side of a rhombus is of length 4cm and the length of an altitude is 3.2cm. Draw the rhombus.

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41. Show that each diagonal of a rhombus bisects the angle through which it passes. Let ABCD be a rhombus whose diagonal AC and BD intersect each other at O.

In $\triangle AOD$ and $\triangle AOB$

$AD = AB$(sides of rhombus are equal)

$AO = AO$(common side)

$DO = OB$(diagonals bisect each other)

$\triangle AOD \cong \triangle AOB$

$\angle DAO = \angle BAO$(cpct)

$\angle ABO = \angle CBO$

$\angle ADO = \angle CDO$

Hence proved

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42. $ABCD$ is a rhombus whose diagonals intersect at O. If $AB = 10cm$, diagonals $BD = 16\,cm$, find the length of diagonal AC

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43.

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44. In Figure, $RENT$ is a rectangle. Its diagonals meet at O. Find x, if $OR = 2x + 4\,and\,OT = 3x + 1$.

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45. $PQRS$ is a square. PR and SQ intersect at O. State the measure of $\angle POQ$.

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46. In Figure, $PQRS$ is a square. Determine $\angle SRP$.

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47. $ABCD$ is a rectangle with $\angle BAC = 32^0$. Determine $\angle DBC$.

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48. The diagonals of a rectangle $ABCD$ meet at O. If $\angle BOC = 44^\circ$, find $\angle OAD$.

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49. In Figure, $ABCD$ is a rectangle. $BM \, and \, DN$ are perpendicular from $B \, and \, D$ respectively on AC. Prove that $MBC \cong DNA$ (ii) $BM = DN$

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50. The diagonals of a rectangle $ABCD$ intersect in O. If $\angle BOC = 68^0$, find $\angle ODA$.

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51. The adjacent figure $PQRS$ is a trapezium in which $SP \| RQ$, find the measures of $\angle P$ and $\angle R$.

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52. Which of the following statements are true for a rectangle? It has two pairs of equal sides. It has all its sides of equal length. Its diagonals are equal. Its diagonals bisect each other. Its diagonals are perpendicular. Its diagonals are perpendicular and bisect each other. Its diagonals are equal and bisect each other. Its diagonals are equal and perpendicular, and bisect each other. All rectangles are squares. All rhombuses are parallelograms. All squares are rhombuses and also rectangles. All squares are not

parallelograms. A rectangle is a parallelogram with one of its angles equal to right angles.

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53. Which of the following statements are true for a square? It is a rectangle. It has all its sides of equal length. Its diagonals bisect each other at a right angle. Its diagonals are equal to its sides.

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54. Fill in the blanks in each of the following, so as to make the statement true: A rectangle is a parallelogram in which....

A square is a rhombus in which.... A square is a rectangle is which....

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55. A window frame has one diagonal longer than the other. Is the window frame a rectangle? Why or why not?

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56. In a rectangle $ABCD$, prove that $ACB \cong CAD$.

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57. The sides of a rectangle are in the ratio 2:3, and its perimeter is 20cm. Draw the rectangle.

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58. The sides of a rectangle are in the 4:5. Find its sides if the perimeter is 90cm.

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59. What is the length of a diagonal of a rectangle whose sides are 5 cm and 12 cm long?

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60. Construct a rectangle of side 8cm and diagonal 10 cm.

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61. Construct a square of side 4.8 cm.

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62. Identify all the quadrilaterals that have: (a) four sides of equal length (b) four right angles

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63. Q3) Explain how a square is: (a) a quadrilateral (b) a parallelogram (c) a rhombus (d) a rectangle

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64. Name the quadrilaterals whose diagonals (i) bisect each other (ii) are perpendicular bisectors of each other (iii) are equal

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65. ABC is a right-angled triangle and O is the mid-point of the side opposite to the right angle. Explain why O is equidistant from A, B and C.

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66. To make a concrete rectangular slab the man should ensure?.

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