



MATHS

BOOKS - MODERN PUBLICATION

QUADRILATERALS

Example

1. Three angles of a quadrilateral measure 68° , 43° and 100° . Find the measure of the fourth angle.



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2. In a quadrilateral ABCD, $\angle A$, $\angle B$, $\angle C$ and $\angle D$ in the ratio 1:2:2:4. find the measure of each angle of the quadrilateral.



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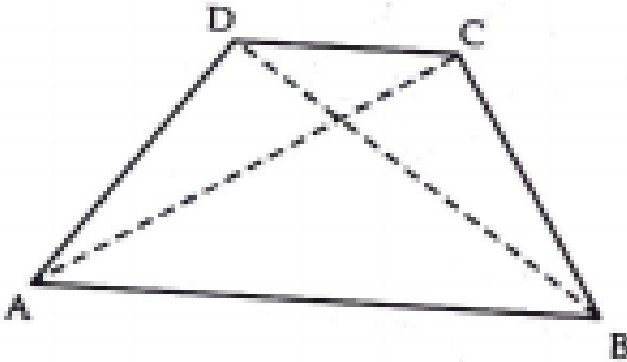
3. In a quadrilateral ABCD, AO and BO are bisectors of $\angle A$ and angle B respectively. Prove that

$$\angle AOB = \frac{1}{2}(\angle C + \angle D)$$



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4. In the fig. ABCD is a quadrilateral in which AB is the largest and CD is the shortest side. Prove that:

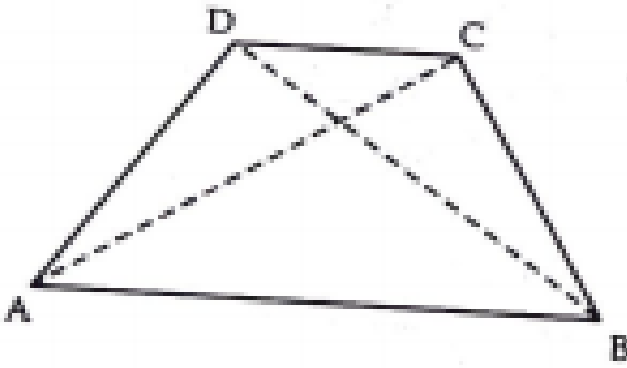


$$\angle C > \angle A$$



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5. In the fig. ABCD is a quadrilateral in which AB is the largest and CD is the shortest side. Prove that:



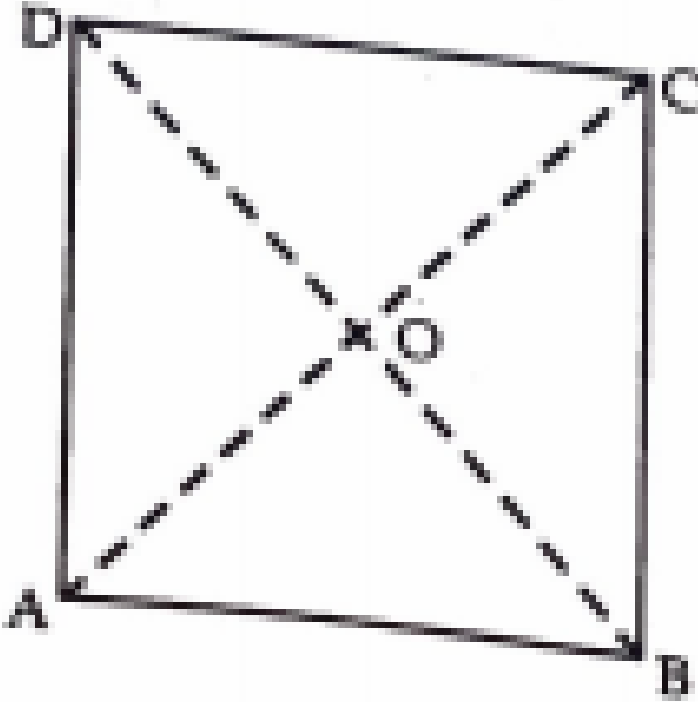
$$\angle D > \angle B$$



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6. In the fig. the point O is in the inside of an equilateral quad. ABCD such that $OB=OD$. Prove that

the points A,O and C are collinear



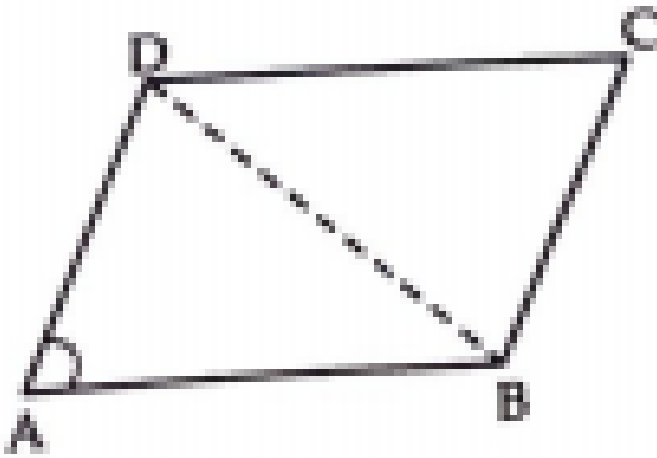
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7. In a ||gm ABCD if $\angle A = 125^\circ$ find $\angle B$, $\angle C$ and $\angle D$.



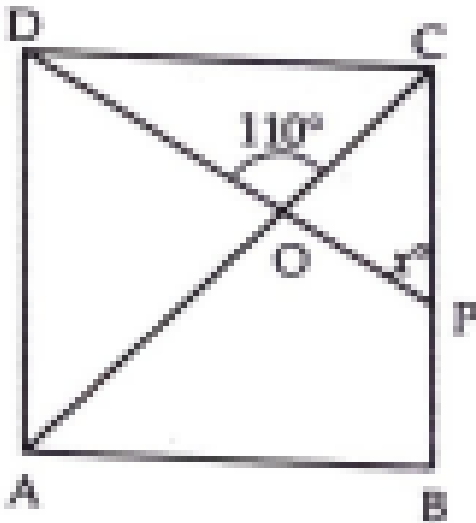
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8. In the fig. ABCD is a rhombus if $\angle A = 66^\circ$ find $\angle CDB$



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9. In the fig. ABCD is a square, A line segment DP cuts BP at P and diagonal AC at O such that $\angle COD = 110^\circ$ and $\angle OPC = x^\circ$. Find the value of x.



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10. ABCD is a rhombus such that $\angle ACB = 40^\circ$.

Then $\angle ADB$ is



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11. ABCD is a square. Determine $\angle DCA$.



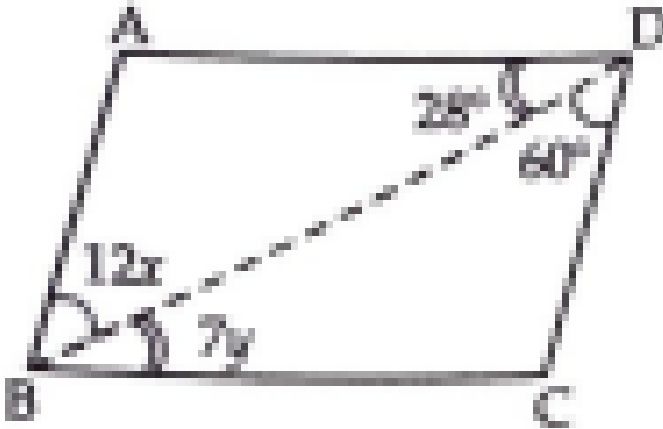
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12. ABCD is a rectangle with $\angle BCA = 34^\circ$ find $\angle DBC$.



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13. In the fig. ABCD is a parallelogram compute the values of x and y



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14. In Fig. find the four angles A, B, C and D in the parallelogram ABCD.



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15. The diagonals of a parallelogram ABCD intersect at O. A line through O intersects AB at P and DC at Q. prove that $OP=OQ$.

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16. ABCD is a parallelogram. AB is produced to E, so that $BE = AB$. Prove that ED bisects BC.

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17. ABCD is a parallelogram and line segments AX, CY bisects the angles A and C respectively show that $AX \parallel CY$.



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18. ABCD is a parallelogram E is the mid point of AB and CE bisects $\angle BCD$. Prove that:

$AE = AD$?



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19. ABCD is a parallelogram E is the mid point of AB

and CE bisects $\angle BCD$. Prove that:

DE bisects $\angle ADC$



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20. ABCD is a parallelogram E is the mid point of AB

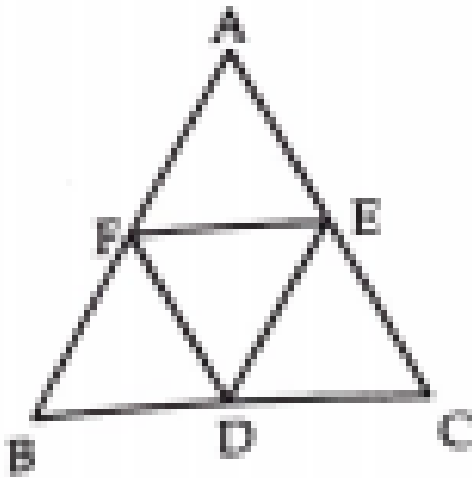
and CE bisects $\angle BCD$. Prove that:

$$\angle DEC = 90^\circ$$



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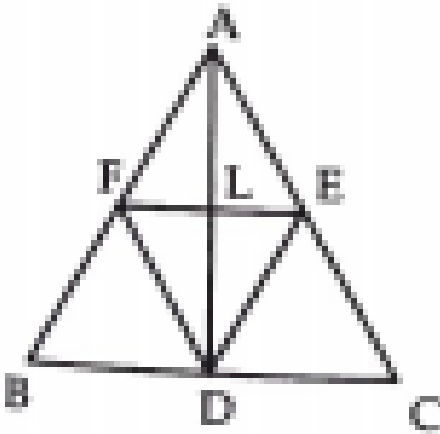
21. D,E and F are respectively the mid points of the sides BC,CA and AB of an equilateral triangle ABC, prove that DEF is also equilateral triangle.



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22. In the fig. ABC, is an isosceles triangle in which $AB=AC$. Also D,E and F are mid point of BC, CB and AB respectively. Show that $AD \perp EF$ and AD is determined by EF

FE.



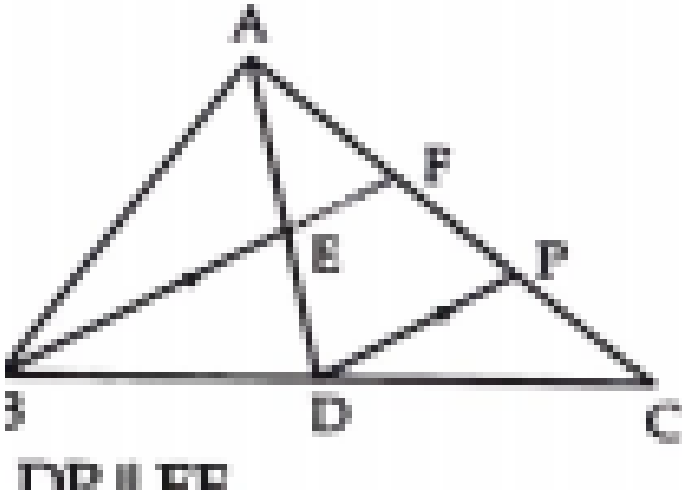
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23. In the fig. AD is a median of triangle ABC and E is the mid point of AD, also BE meets AC in F. prove

$$\text{that } AF = \frac{1}{3}AC$$

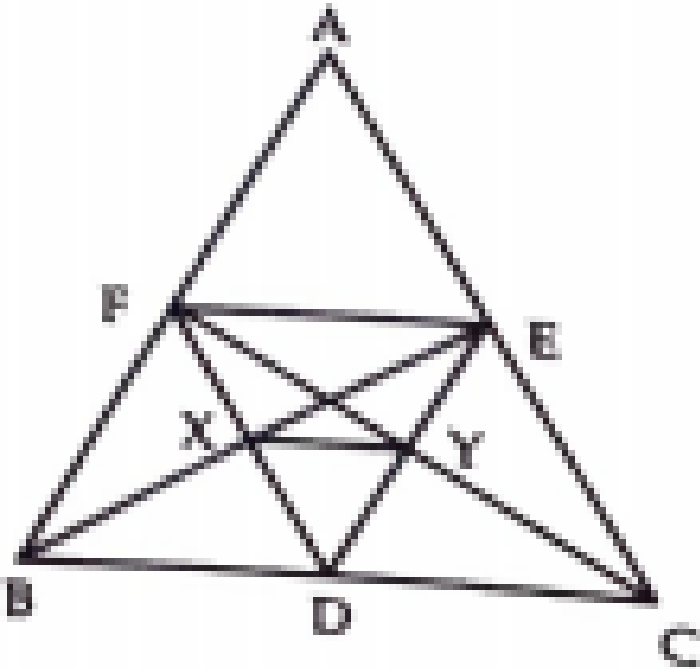


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24. In the fig D,E and F are the mid points of the sides BC,CA and AB respectively of $\triangle ABC$. If BE

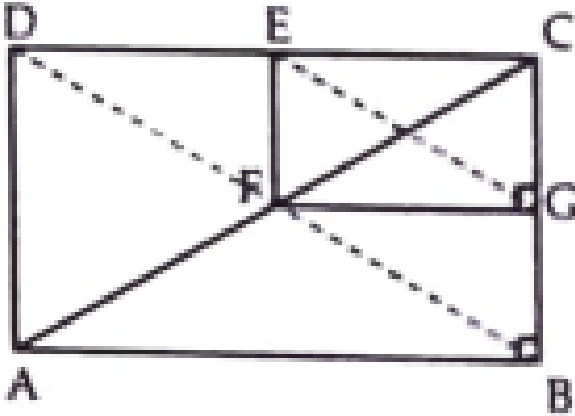
and DF intersect at X while CF and DE intersect at Y.

prove that $XY = \frac{1}{4}BC$



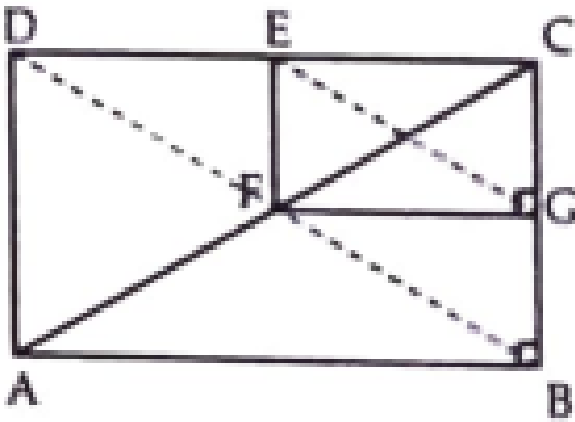
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25. In the fig. ABCD and EFGC are rectangles, where F is the mid point of AC. Prove that: $DE=EC$



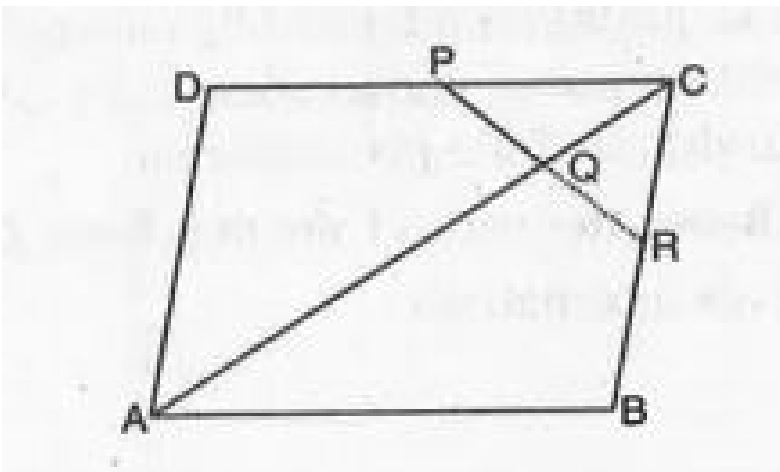
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26. In the fig. ABCD and EFGC are rectangles, where F is the mid point of AC. Prove that: $EG = \frac{1}{2}AC$



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27. In Fig.



ABCD is a parallelogram in which P is the mid-point

of DC and Q is a point on AC such that $CQ = \frac{1}{4}AC$.

If PQ produced meets BC at R, prove that R is a mid-point of BC.



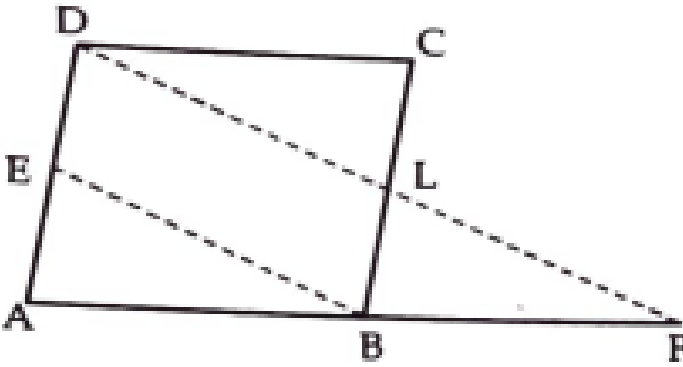
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28. E and F are the mid points of non-parallel sides AD and BC respectively of a trapezium prove that $EF \parallel AB$.



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29. In the fig. ABCD is parallelogram and E is the mid point of AD. A line through D, drawn parallel to EB, meets AB produced at F and BC at L. prove that



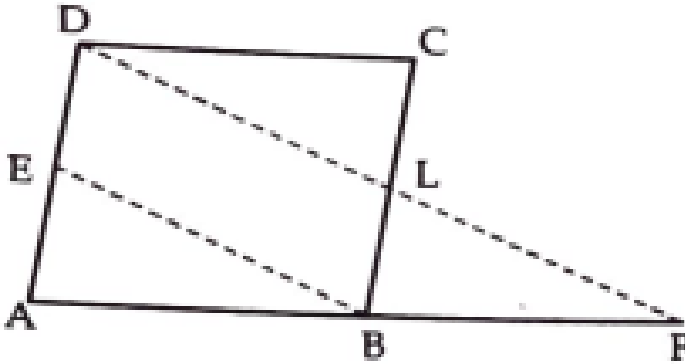
$$AF=2DC$$



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30. In the fig. ABCD is parallelogram and E is the mid point of AD. A line through D, drawn parallel to EB,

meets AB produced at F and BC at L . prove that $DF=2DL$.



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31. Show that the st. Line joining the mid-points of two non-parallel sides of a trapezium is parallel to the bases and is equal to half of the sum of their lengths.



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32. While studying properties of triangle, Rakesh, a student of class IX concluded that all four angle of quadrilateral must be acute.

Justify on behalf of Rakesh.



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33. While studying properties of triangle, Rakesh, a student of class IX concluded that all four angle of quadrilateral must be acute.

Justify on behalf of Rakesh.

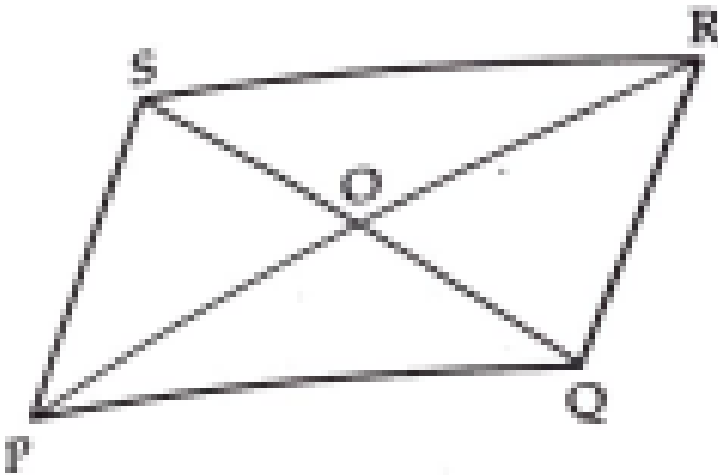


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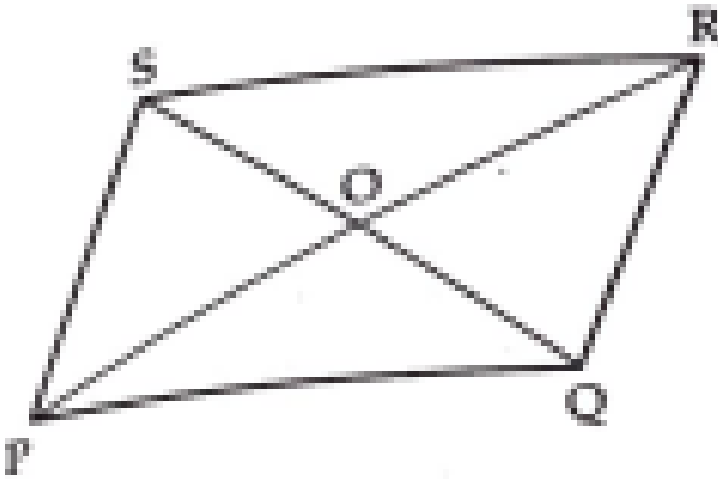
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34. PQRS is a rhombus where $\angle PSR = 120^\circ$. There are two fire stations R and S and fire is represent at O. Which fire stations team can reach early?



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35. PQRS is a rhombus where $\angle PSR = 120^\circ$. There are two fire stations R and S and fire is represent at O. Which value is depicted?



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36. In a triangle ABC find the measures of all the angles of the triangle formed by joining the mid

points of the sides of this triangle.



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37. The angles of quadrilateral are in the ratio $3 : 5 : 9 : 13$. Find all the angles of the quadrilateral.



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38. Which of the following statements are True or

False :

If the diagonals of a parallelogram are equal then it is a rectangle.



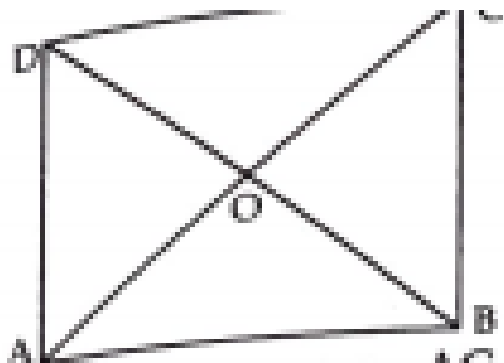
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39. If diagonals of a quadrilateral bisect each other at right angles, then it is a :

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40. Show that the diagonals of a square are equal and bisect each other at right angles

Q. 40

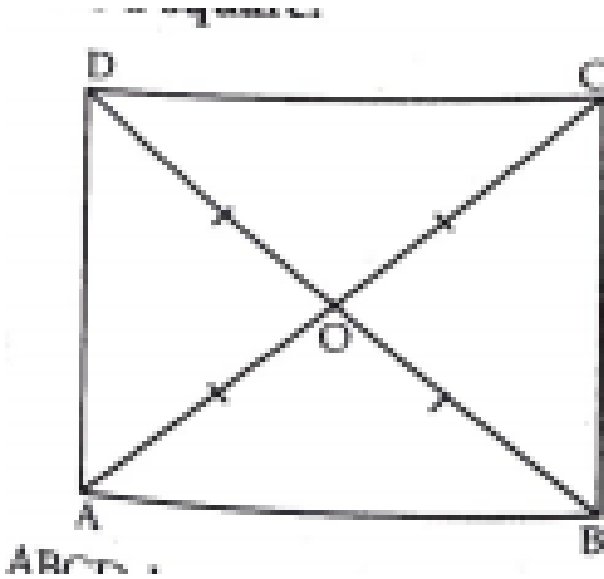


Given: ABCD is a square. AC and BD



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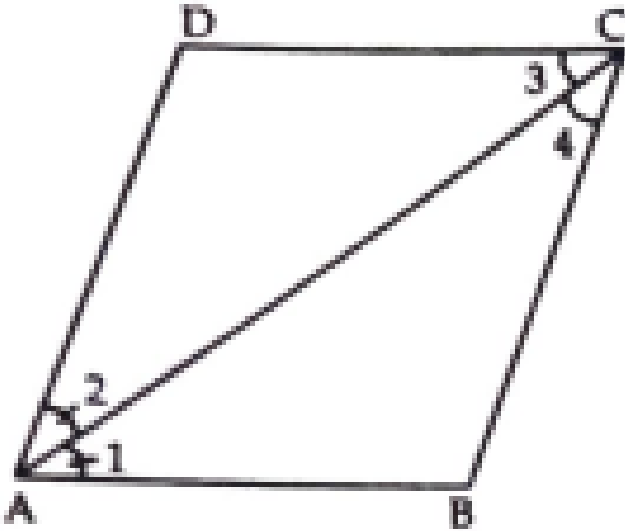
41. Show that if the diagonals of a quadrilateral are equal and bisect each other at right angles, then it is a square



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42. Diagonal AC of a parallelogram ABCD bisects $\angle A$

show that



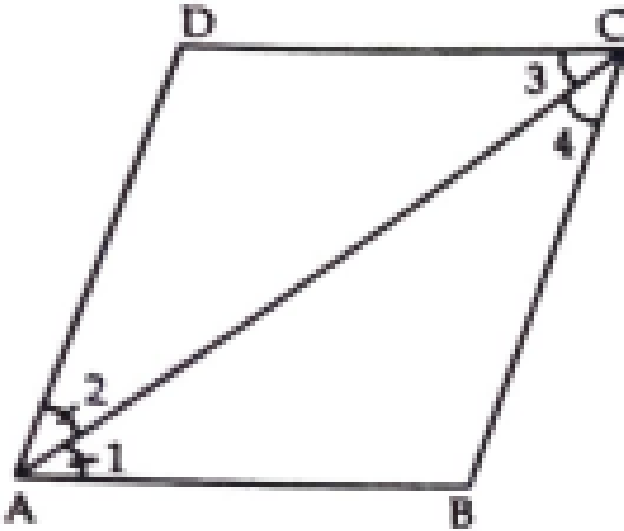
If bisects $\angle C$ also.



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43. Diagonal AC of a parallelogram ABCD bisects $\angle A$

show that



ABCD is a rhombus.



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44. ABCD is a rhombus. Show that the diagonal AC bisects $\angle A$ as well as $\angle C$ and diagonal BD bisects $\angle B$ as well as $\angle D$.



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45. ABCD is a rectangle in which diagonal AC bisects $\angle A$ as well as $\angle C$. Show that ABCD is a square.



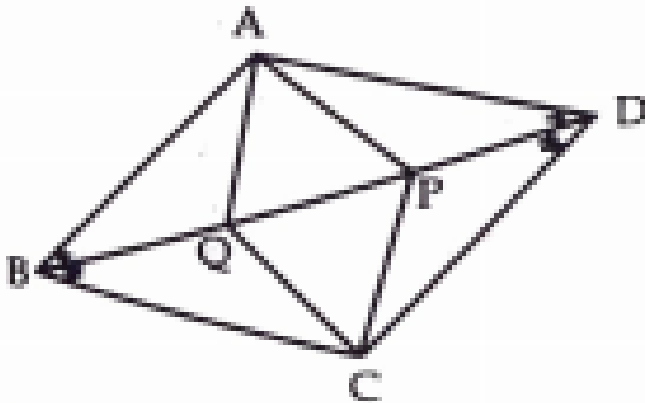
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46. ABCD is a rectangle in which diagonal AC bisects $\angle A$ as well as $\angle C$. Show that $\widehat{Diagonal BD}$ bisects $\perp h$

/_Baswellas/_D`.

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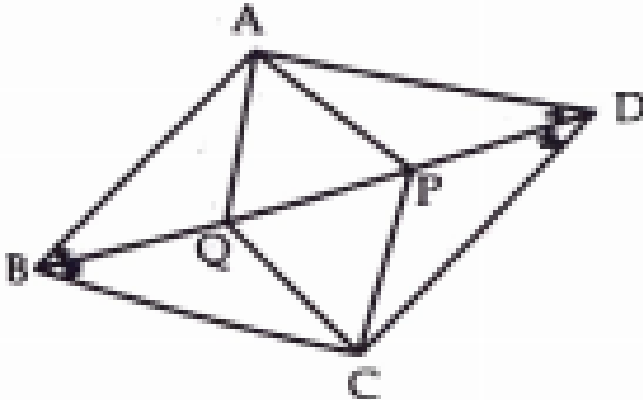
47. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that $DP=BQ$



show that: $\triangle APD \equiv \triangle CQB$

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48. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that $DP=BQ$



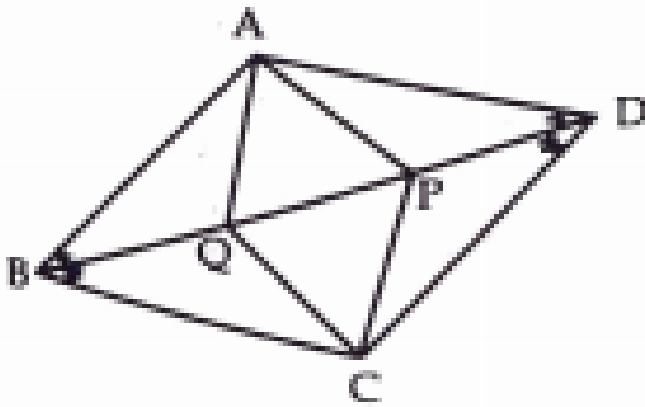
that

$$AP=CQ$$



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49. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that $DP=BQ$



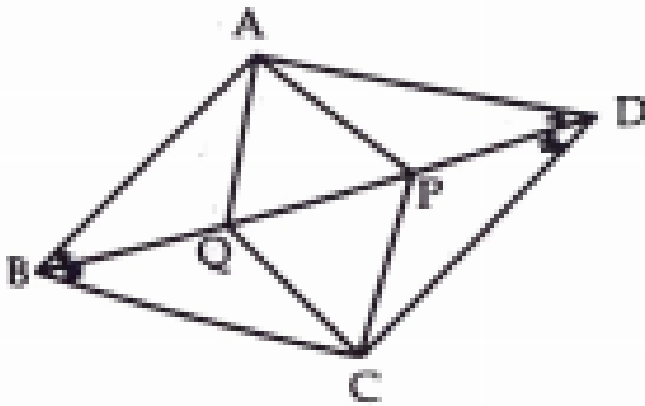
that

Show that: $\triangle AQB \equiv \triangle CRD$



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50. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP=BQ



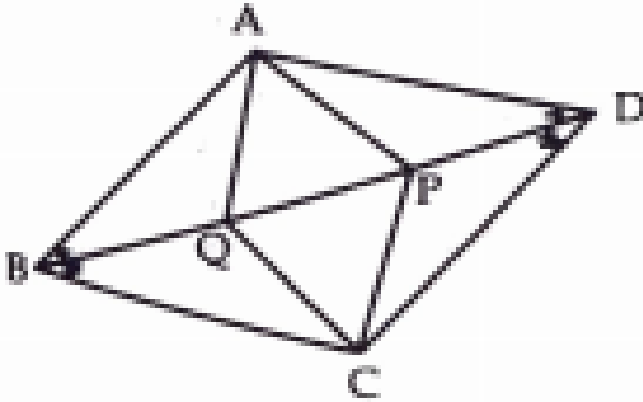
that

Show that: $AQ=CR$

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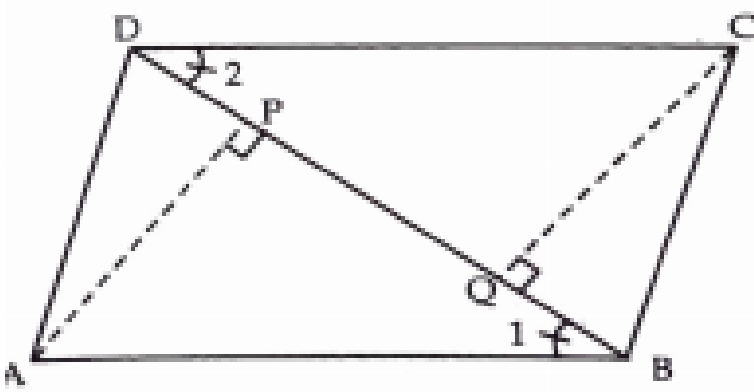
51. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that $DP=BQ$. Show that

APCQ is a parallelogram.



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52. ABCD is a parallelogram and AP and CQ are the perpendiculars from vertices A and C on diagonal

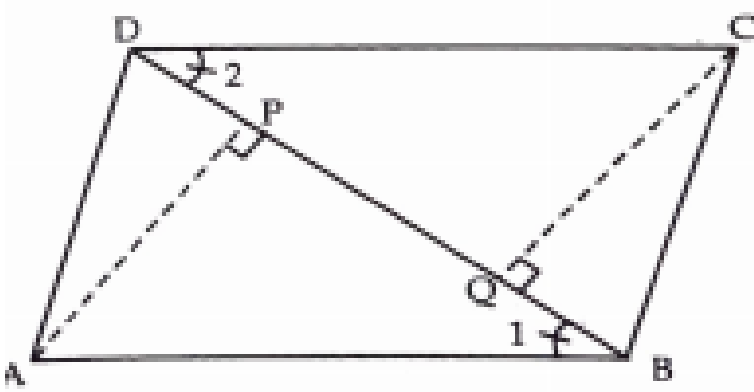


Show that: $\triangle APB \equiv \triangle CQD$



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53. ABCD is a parallelogram and AP and CQ are the perpendiculars from vertices A and C on diagonal

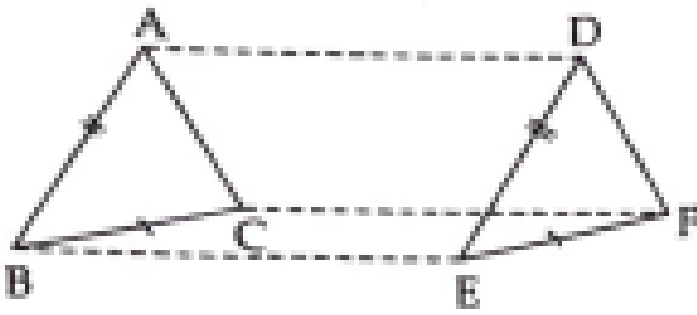


Show that: $AP=CQ$



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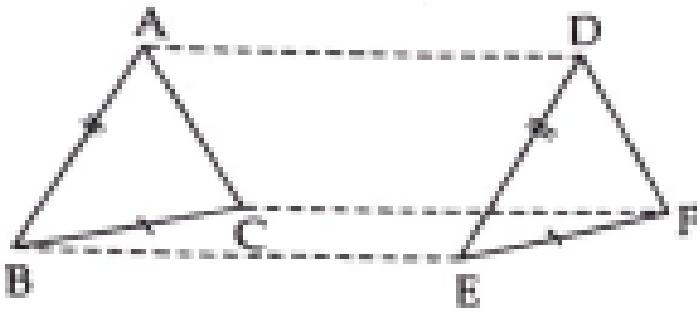
54. In $\triangle ABC$ and $\triangle DEF$, $AB=DE$, $AB \parallel DE$, $BC=EF$ and $BC \parallel EF$. Vertices A,B and C are joined to vertices D,E and F respectively



Show that: quadrilateral $ABED$ is a parallelogram.

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55. In $\triangle ABC$ and $\triangle DEF$, $AB=DE$, $AB\parallel DE$, $BC=EF$ and $BC\parallel EF$. Vertices A, B and C are joined to vertices D, E and F respectively

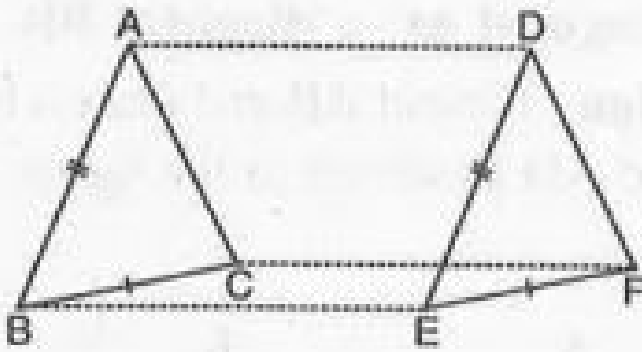


quadrilateral BEFC is a parallelogram.



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56. In $\triangle ABC$ and $\triangle DEF$, $AB = DE$, $AB \parallel DE$, $BC = EF$ and $BC \parallel EF$. Vertices A, B and C are joined to vertices D, E and F respectively (See fig.)

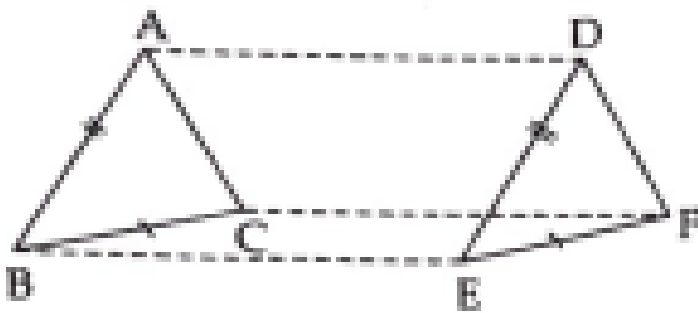


Show

that $AD \parallel CF$ and $AD = CF$.

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57. In $\triangle ABC$ and $\triangle DEF$, $AB = DE$, $AB \parallel DE$, $BC = EF$ and $BC \parallel EF$. Vertices A, B and C are joined to vertices D, E and F respectively

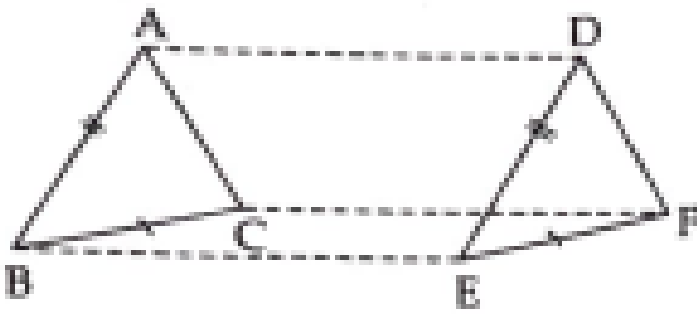


Quadrilateral ACFD is a parallelogram.



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58. In $\triangle ABC$ and $\triangle DEF$, $AB=DE$, $AB\parallel DE$, $BC=EF$ and $BC\parallel EF$. Vertices A,B and C are joined to vertices D,E and F respectively

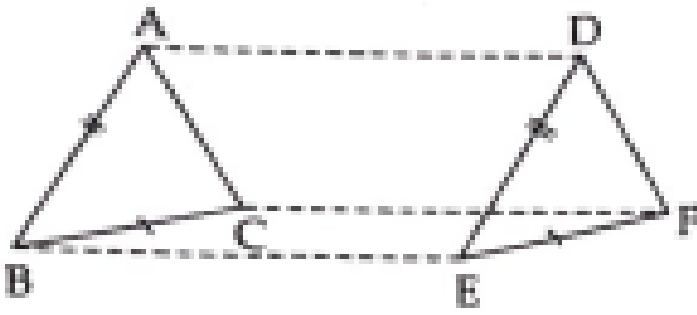


$$AC=DF$$



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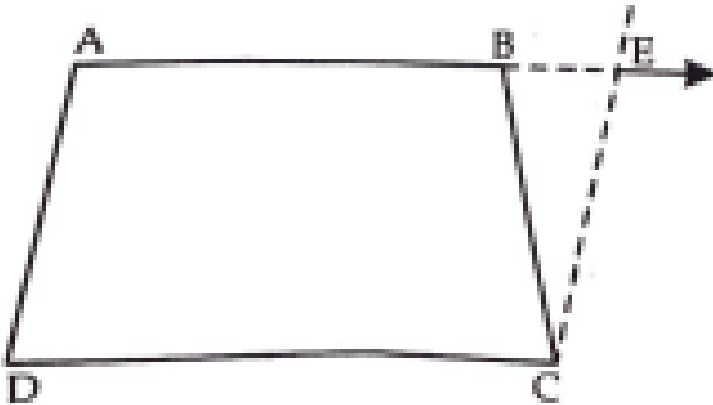
59. In $\triangle ABC$ and $\triangle DEF$, $AB=DE$, $AB \parallel DE$, $BC=EF$ and $BC \parallel EF$. Vertices A, B and C are joined to vertices D, E and F respectively



$$\triangle ABC \cong \triangle DEF$$

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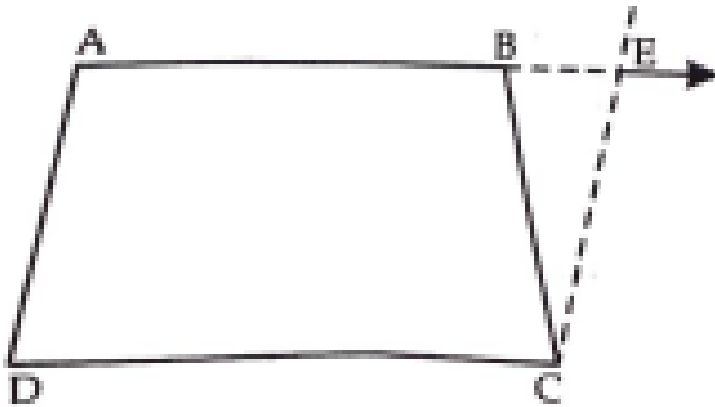
60. ABCD is a trapezium in which $AB \parallel CD$ and $AD = BC$



Show that: $\angle A = \angle B$

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61. ABCD is a trapezium in which $AB \parallel CD$ and $AD = BC$

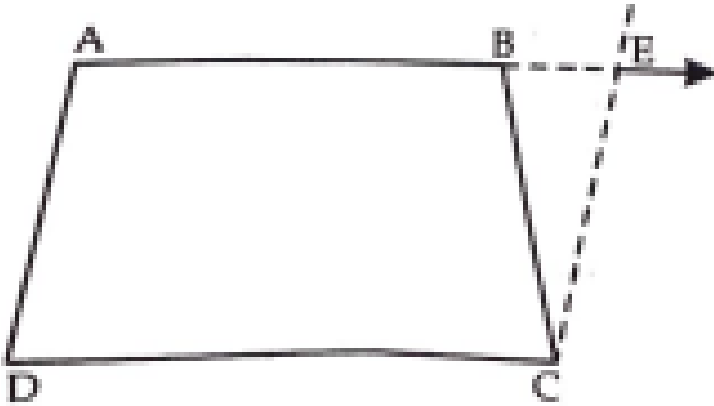


$$\angle C = \angle D$$

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62. ABCD is a trapezium in which $AB \parallel CD$ and $AD = BC$

then show that

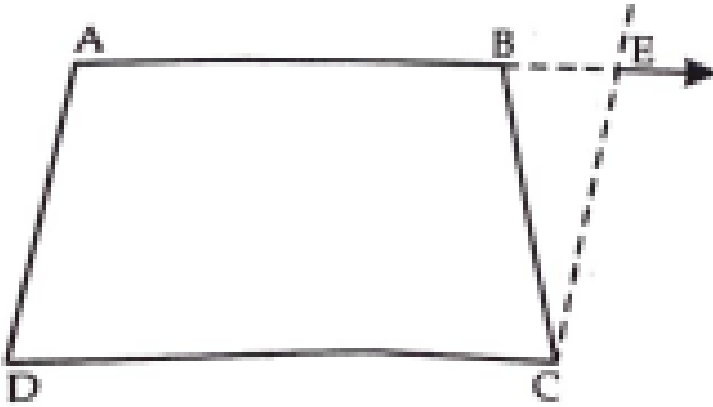


$$\triangle ABC \cong \triangle BAD$$



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63. ABCD is a trapezium in which $AB \parallel CD$ and $AD = BC$

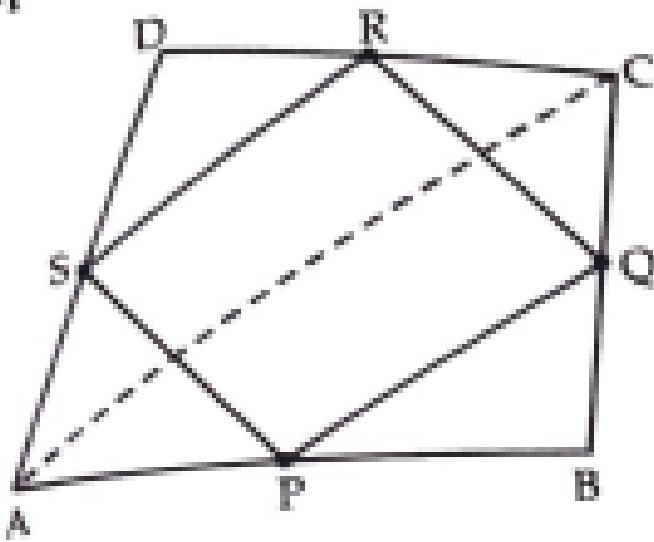


diagonal $AC =$ diagonal BD

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64. ABCD is a quadrilateral in which P, Q, R and S are the mid points of sides AB, BC, CD and DA respectively

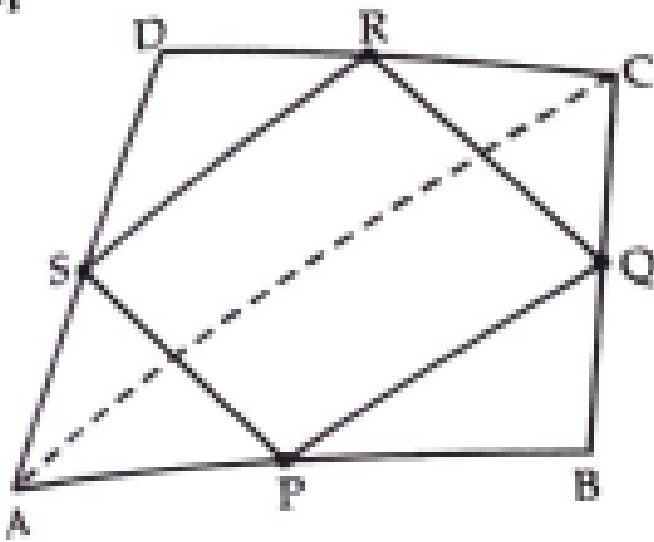
AC is a diagonal



show that: $SR \parallel AC$ and $SR = \frac{1}{2}AC$

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65. ABCD is a quadrilateral in which P,Q,R and S are the mid points of sides AB,BC,CD and DA respectively
AC is a diagonal

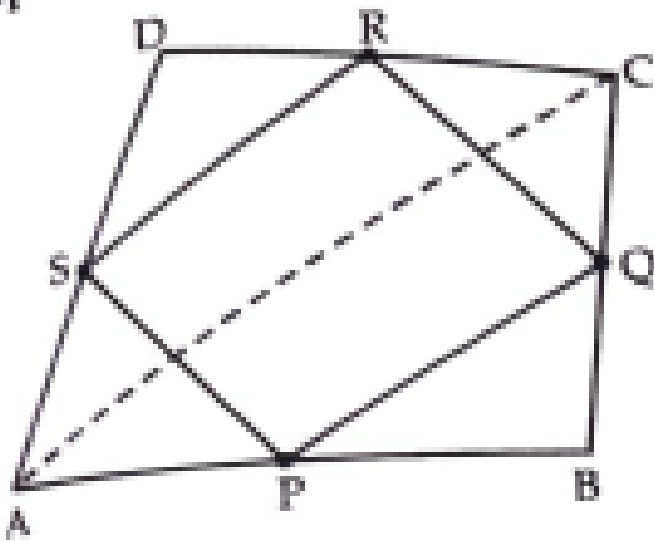


show that: $PQ=SR$



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66. ABCD is a quadrilateral in which P,Q,R and S are the mid points of sides AB,BC,CD and DA respectively
AC is a diagonal



show that: PQRS is a parallelogram.

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67. ABCD is a rhombus and P, Q, R, S are the mid-points of AB, BC, CD and DA respectively. Prove that quadrilateral PQRS is a rectangle.

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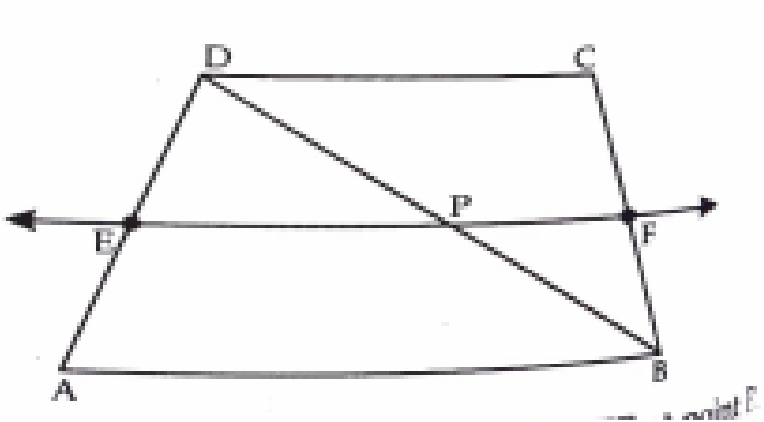
68. ABCD is a rectangle and P, Q, R and S are the mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus.



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69. ABCD is a trapezium, in which $AB \parallel DC$ are a diagonal and E is the mid point of AD. A is drawn through E, parallel to AB intersect BC at F. Show that

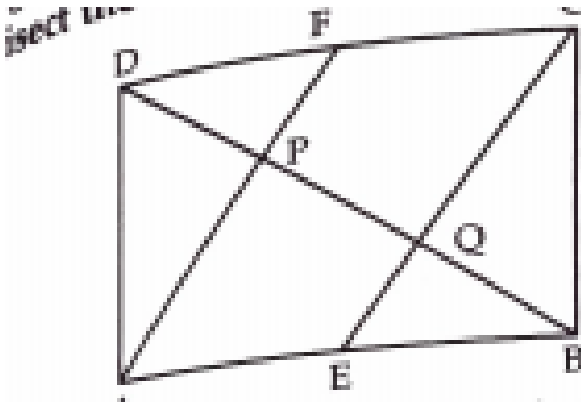
F is the mid point of BC



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70. In a parallelogram ABCD, E and F are the mid points of sides AB and CD respectively show that the

line segments AF and EC trisect the diagonal BD



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71. Show that the line segments joining the mid-points of opposite sides of a quadrilateral bisect each other.

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72. ABC is a triangle right angled at C. A line through the mid-point M of hypotenuse AB and parallel to BC intersects AC at D. Show that D is the mid-point of AC.



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73. ABC is a triangle right angled at C. A line through the mid-point M of hypotenuse AB and parallel to BC intersects AC at D. Show that D is the mid-point of AC.



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74. ABC is a triangle right angled at C. A line through the mid-point M of hypotenuse AB and parallel to BC intersects AC at D. Show that $CM = MA = \frac{1}{2}AB$.



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75. Diagonals AC and BD of a parallelogram ABCD intersect each other at O. if $OA=3$ cm and $OD=2$ cm, determine the length of AC and BD.



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76. Can the angles 100° , 80° , 70° and 95° be the angles of a quadrilateral? Why or why not?



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77. In a quadrilateral $ABCD$, $\angle A$, $\angle B$, $\angle C$ and $\angle D$ in the ratio $1:2:2:4$. find the measure of each angle of the quadrilateral.



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78. All the angles of a quadrilateral are equal. What special name is given to this quadrilateral?



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79. Diagonals of a rectangle are equal and perpendicular. Is this statement true? Give reasons for your answer.



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80. Can you have all four angles of a quadrilateral obtuse angles? Give reasons for your answer.



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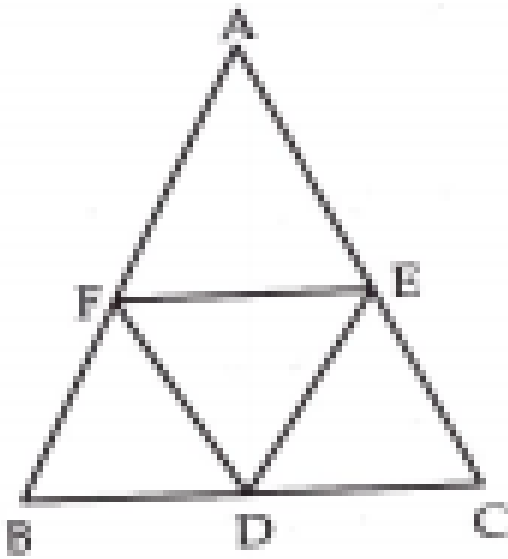
81. If in a triangle $AB=a, AC=b$ and D, E are the mid-points of AB and AC respectively, then DE is equal to



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82. In the given figure, it is given that $BDEF$ and $FDCE$ are parallelograms. Can you say that $BD=CD$? Why or

why not?



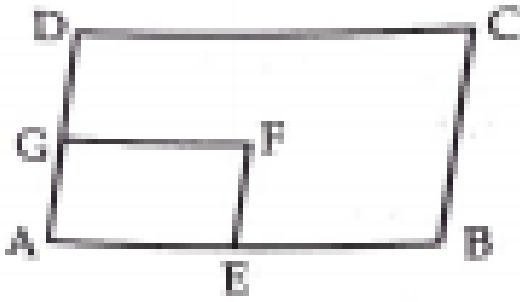
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83. In fig. ABCD and AEFG are two parallelograms. If

$\angle C = 55^\circ$ and determine $\angle F$



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84. Can all the angles of a quadrilateral be acute angles? Give reason for you answer.

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85. If one of the angles formed by two intersecting lines is a right angle, what can you say about the

other three angles? Give reason for your answer.

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86. Diagonals of a quadrilateral ABCD bisect each other. If $\angle A = 35^\circ$ determine $\angle B$.

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87. Opposite angles of a quadrilateral ABCD are equal. If $AB=4$ cm determine CD.

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88. One angle of a quadrilateral is of 108° and the remaining three angles are equal. Find each of the three equal angles.



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89. ABCD is a trapezium in which $AB \parallel DC$ and $\angle A = \angle B = 45^\circ$. Find angles C and D of the trapezium.



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90. The angle between two altitudes of a parallelogram through the vertex of an obtuse angle of parallelogram is 60° . Find the angles of the parallelogram.



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91. If the length of the side of a rhombus is equal to the length of one diagonal Find the angles of the rhombus .



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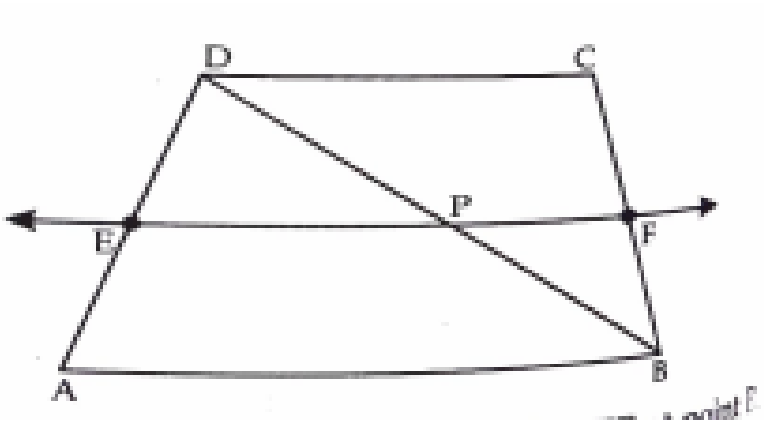
92. E and F are points on diagonals AC of a parallelogram ABCD such that $AE=CF$. show that BFC parallelogram



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93. ABCD is a trapezium, in which $AB \parallel DC$ are a diagonal and E is the mid point of AD. A is drawn through E, parallel to AB intersect BC at F. Show that

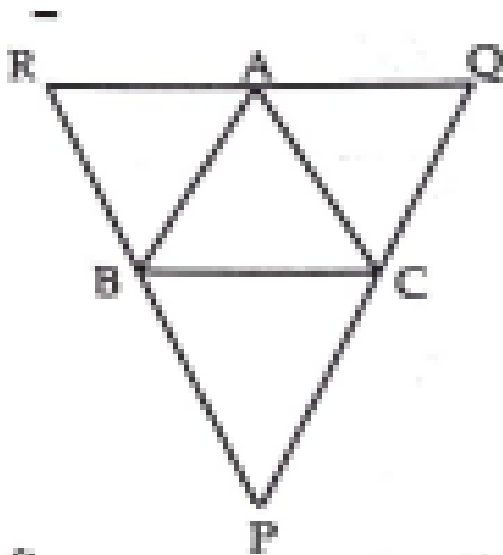
F is the mid point of BC



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94. Through A,B and C lines RQ,PR and QP have been drawn, respectively parallel to sides BC, CA and AB of

a $\triangle ABC$ as shown in fig. show that $BC = \frac{1}{2}QR$



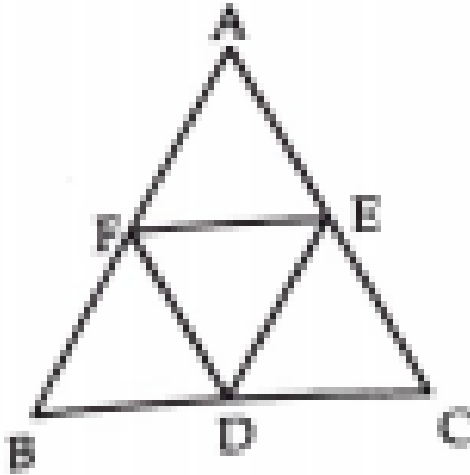
the fig.



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95. D,E and F are respectively the mid points of the sides BC,CA and AB of an equilateral triangle ABC,

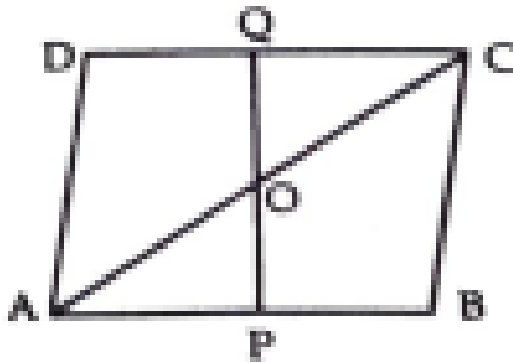
prove that DEF is also equilateral triangle.



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96. Points P and Q have been taken on opposite sides AB and CD. Respectively of a parallelogram ABCD such that $AP=CQ$. Show that AC and PQ bisect

each other

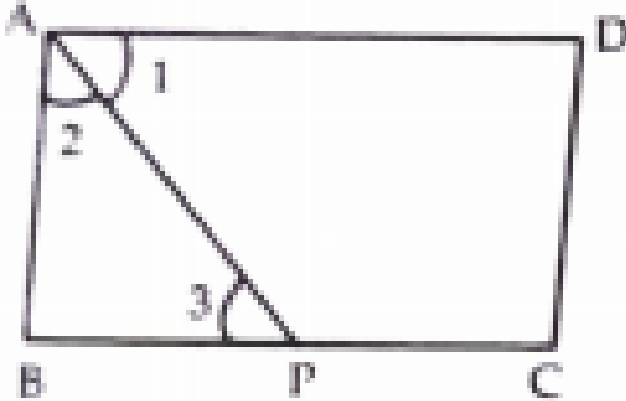


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97. In fig. P is the mid point of side BC of a parallelogram ABCD such that $\angle BAP = \angle DAP$

prove that $AD=2CD$

Given $AD = 2CD$.



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98. A square is inscribed in an isosceles right triangle so that the square and the triangle share a common angle. Show that the vertex of a square opposite in vertex of the common angle bisects the hypotenuse.



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99. In a parallelogram ABCD, $AB=10$ cm and $AD=6$ cm. The bisectors of $\angle A$ meet DC in an AE and BC produced at F. find the length of CF.



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100. ABCD is a rectangle and P, Q, R and S are the mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus.



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101. P,Q,R and S are respectively the mid points of the sides AB,BC,CD and DA of a quadrilateral ABCD such that $AC \perp BD$. Prove that PQRS is a rectangle.



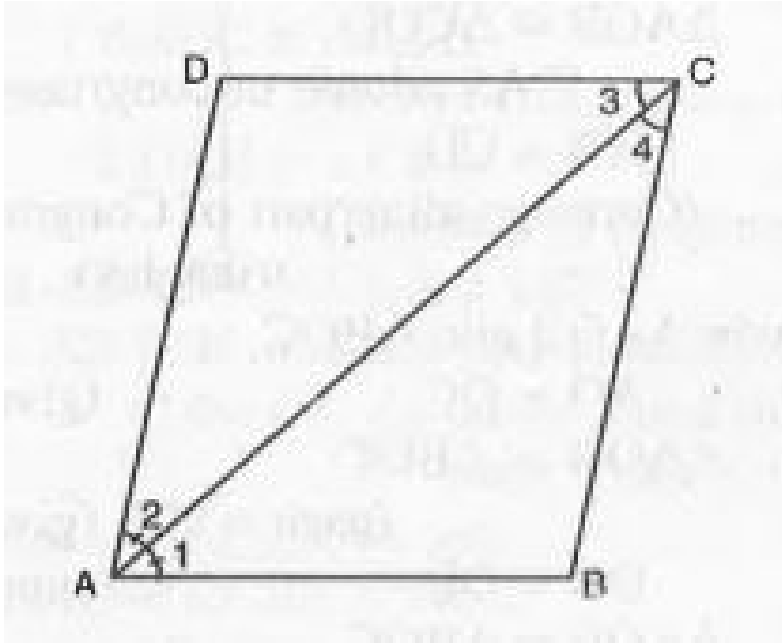
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102. P,Q,R and S are respectively the mid points of the sides AB,BC,CD and Da of a quadrilateral ABCD in which $AC=BD$ and $AC \perp BD$. Prove that PQRS is a square.



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103. Diagonal AC of a parallelogram ABCD bisects $\angle A$ (See fig.)



Show

that ABCD is a rhombus.



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104. P,Q are the mid points of the opposite side AB and CD of a parallelogram ABCD. AP intersects DP at S and BQ intersects CP at P. Show that PQRS is a parallelogram.



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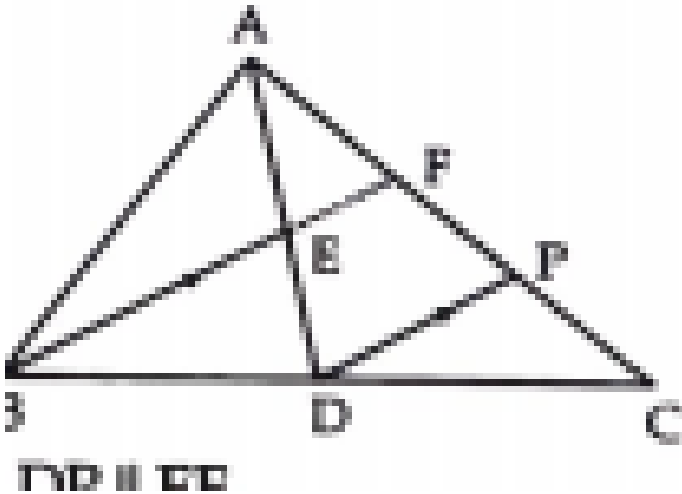
105. ABCD is a quadrilateral in which $AB \parallel DC$ and $AD=BC$. Prove that $\angle A = \angle B$ and $\angle C = \angle D$.



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106. In the fig. AD is a median of triangle ABC and E is the mid point of AD, also BE meets AC in F. prove

$$\text{that } AF = \frac{1}{3}AC$$



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107. Prove that the figure formed by joining the mid-points of the pairs of consecutive sides of a

quadrilateral is a parallelogram.



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108. E and F are the mid points of non-parallel sides AD and BC respectively of a trapezium prove that $EF \parallel AB$.



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109. The bisectors of angles of a parallelogram form a :
a :



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110. P and Q are points on opposite sides AD and BC of a parallelogram ABCD such that PQ passes through the point of intersection of its diagonals AC and BD. Show that PQ is bisected at O.



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111. ABCD is a rectangle in which diagonal AC bisects $\angle A$ as well as $\angle C$. Show that ABCD is a square.



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112. D,E and F are respectively the mid points of the sides AB,BC and CA of a triangle ABC. Prove that by joining these mid points D,E and F and the triangle ABC is divided into four congruent triangles.



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113. Prove that the line joining the mid points of the diagonals of a trapezium is parallel to the parallel sides of the trapezium.



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114. P is the mid point of the side CD of a parallelogram ABCD, a line through C parallel to PA intersects AB at Q and DA produced by A. Prove that $DA=AR$ and $CQ=QR$.



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Exercise

1. Three angles of a quadrilateral are respectively 50° and 110° and 100° . Find the fourth angles.



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2. The angles of a quadrilateral are in the ratio 2: 4: 5:

7. find the angles.



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3. In the quad. ABCD is a point inside it. Find that

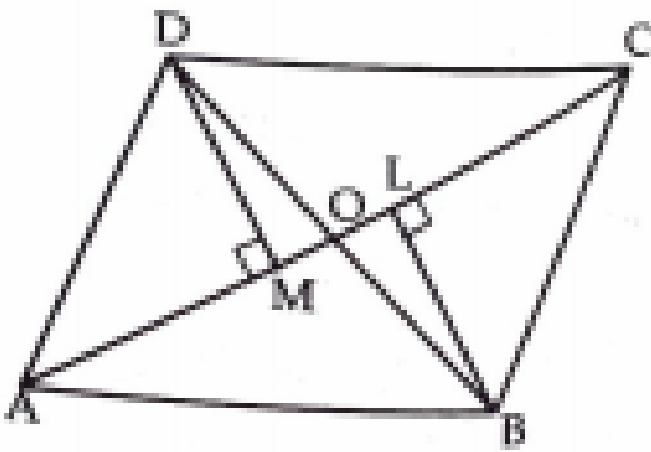
$OA+OB+OC+OD > AC+BD$.



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4. In the fig. $BL \perp AC$ and $DM \perp AC$. If $BL=LM$

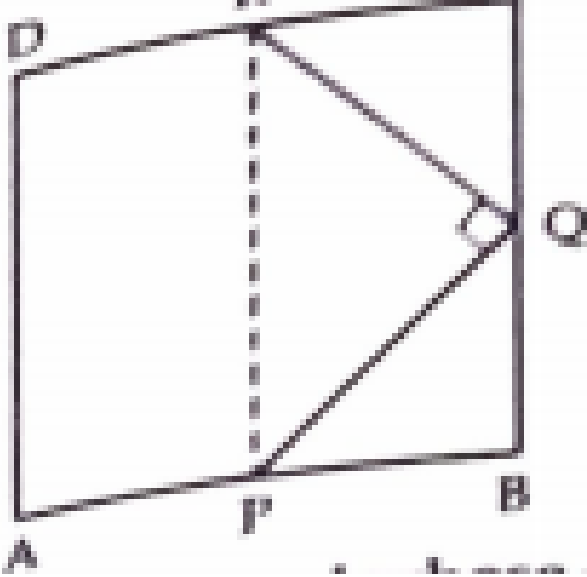
prove that AC bisects BD



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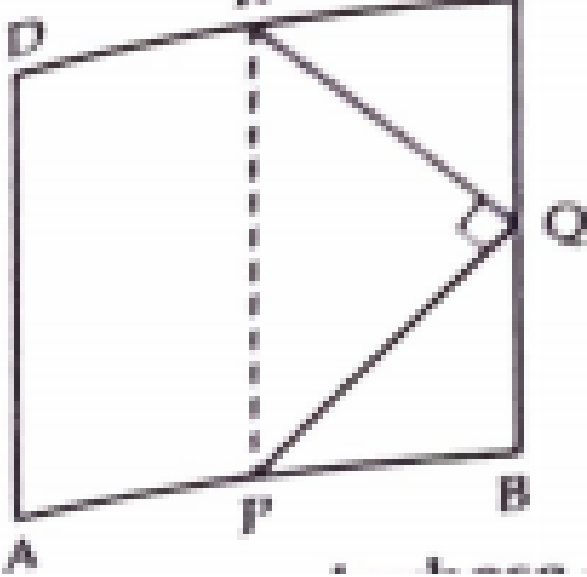
5. In the fig. ABCD is a square and $\angle PQR = 90^\circ$

$PB=QC=DR$, prove that: $QB=RC$



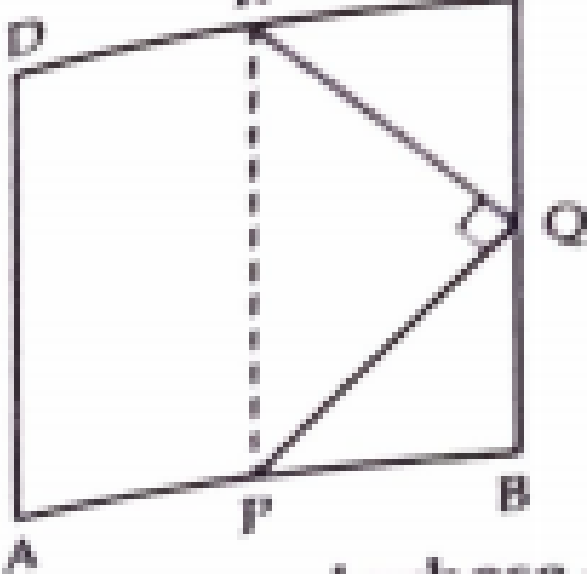
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6. In the fig. ABCD is a square and $\angle PQR = 90^\circ$
 $PB=QC=DR$, prove that: $PQ=QR$



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7. In the fig. ABCD is a square and $\angle PQR = 90^\circ$
 $PB=QC=DR$, prove that: $\angle QPR = 45^\circ$



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8. ABCD is a quadrilateral whose diagonals AC and BD intersect at O, prove that:

$$(AB+BC+CD+DA) > (AC+BD)$$

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9. ABCD is a quadrilateral whose diagonals AC and BD intersect at O, prove that:

$$(AB+BC+CD+DA) > 2(AC+BD)$$



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10. A diagonal of a rectangle is inclined to one side of the rectangle at 25° . The acute angle between the diagonals is



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11. In a parallelogram, prove that sum of any two consecutive angles is 180° .



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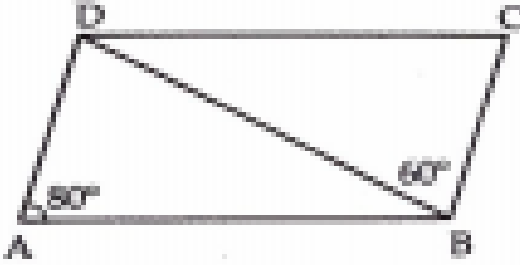
12. If an angle of a parallelogram is two third of its adjacent angle, find the angles of the parallelogram.



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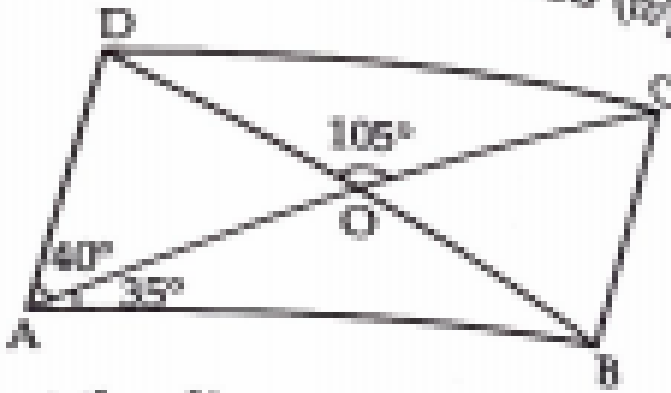
13. In the fig. ABCD is a parallelogram in which $\angle DAB = 60^\circ$ and $\angle DBC = 80^\circ$ find $\angle CDB$ and

$\angle ADB$



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14. In the fig. ABCD is a parallelogram in which $\angle BAO = 35^\circ$, $\angle DAO = 40^\circ$ and $\angle COD = 105^\circ$

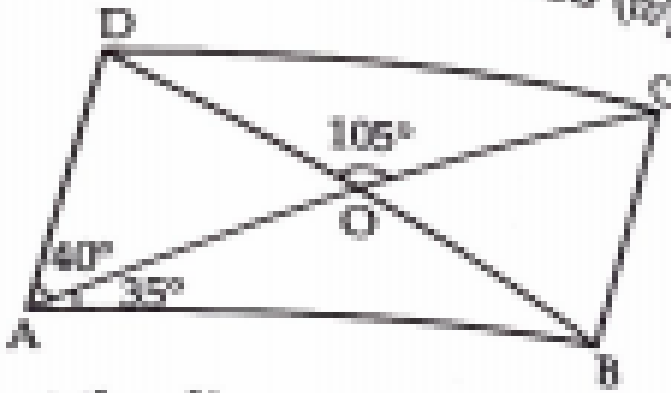


that the diagonals of a parallelogram bisect each other.

find that: $\angle ABO$?

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15. In the fig. ABCD is a parallelogram in which $\angle BAO = 35^\circ$, $\angle DAO = 40^\circ$ and $\angle COD = 105^\circ$

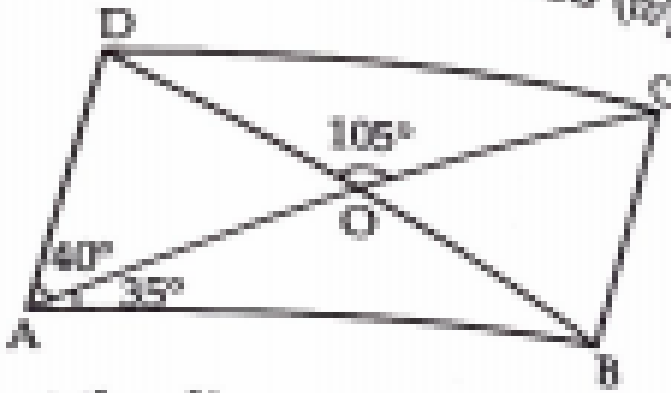


that the diagonals of a parallelogram bisect each other.

find that: $\angle ODC$?

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16. In the fig. ABCD is a parallelogram in which $\angle BAO = 35^\circ$, $\angle DAO = 40^\circ$ and $\angle COD = 105^\circ$

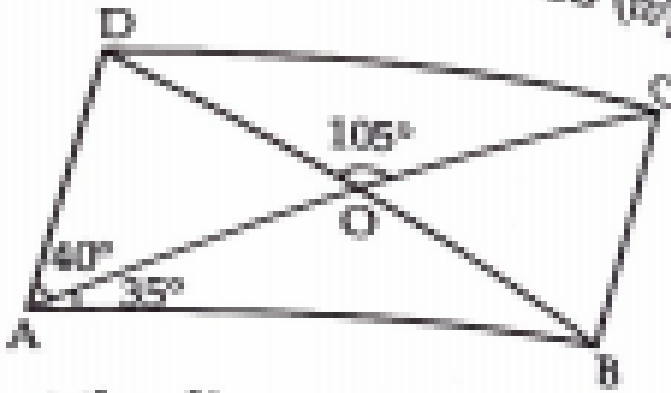


that the diagonals of a parallelogram bisect each other.

find that: $\angle ACB$

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17. In the fig. ABCD is a parallelogram in which $\angle BAO = 35^\circ$, $\angle DAO = 40^\circ$ and $\angle COD = 150^\circ$



that the diagonals of a parallelogram bisect each other.

find that: $\angle CDO$

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18. The diagonals of a rhombus are perpendicular to each other .

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19. The diagonals of a rectangle ABCD meet at o and $\angle BOC = 44^\circ$ and find $\angle OAD$.

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20. ABCD is a rectangle with $\angle ABD = 40^\circ$ determine $\angle DBC$.

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21. The sides AB and CD of a parallelogram ABCD are bisected at E and F. prove that EBFD is parallelogram.

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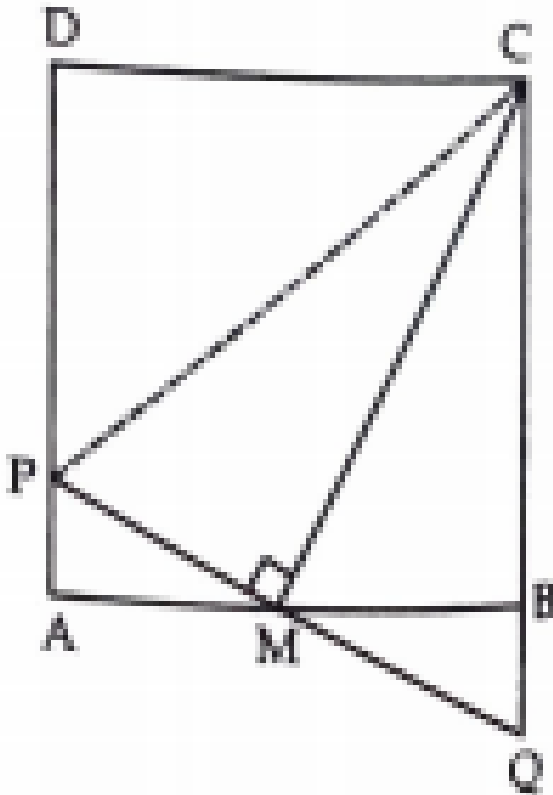
22. Two adjacent angles of a parallelogram have equal measure. Find the measure of each of the angles of the parallelogram.

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23. The lengths of the diagonals of a rhombus are 10 cm and 8.2 cm .Its area will be :

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24. In the fig. ABCD is a square M is the mid point and $PQ \perp CM$ meets AD at and CB produced prove that



PA=BQ?

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25. ABCD is a square M is the mid point of AB .

$PQ \perp CM$. PQ meets AD at P and CB at Q prove

that

$CP=CQ$



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26. ABCD is a parallelogram. L and M are points on

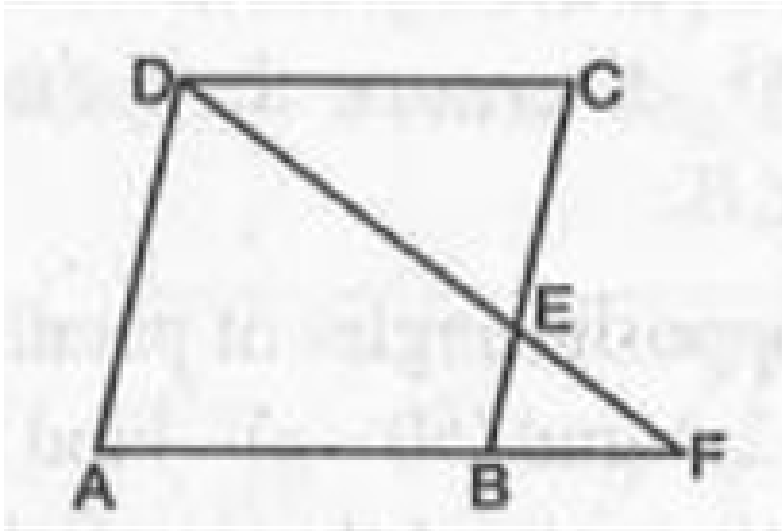
AB and DC respectively and $AL = CM$. Prove that LM

and BD bisect each other.



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27. In Fig. .

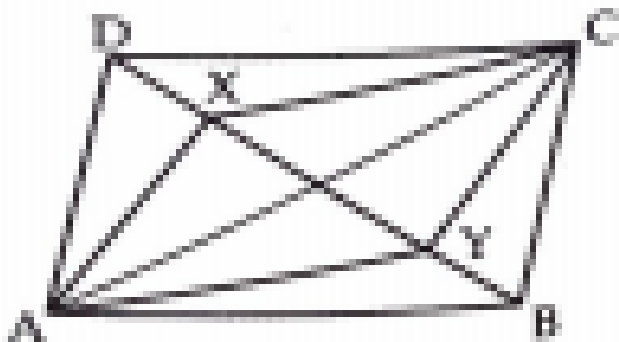


ABCD is a parallelogram and E is the mid-point of side BC. If DE and AB, when produced meet at F, prove that $AF = 2AB$.



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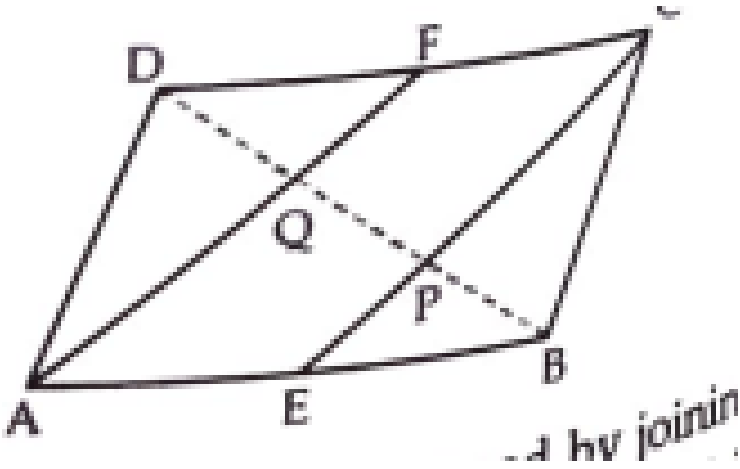
28. In the fig. ABCD is a parallelogram and X,Y and Z the points on diagonal BD such that $DX=BD$ prove that CXAY is a parallelogram.



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29. In the fig ABCD is a parallelogram in which E and F are mid points of AB and CD respectively. Prove that the line segments CE and AF intersect diagonal

BD



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30. Prove that the figure formed by joining the points of the adjacent sides of a quadrilateral parallelogram.

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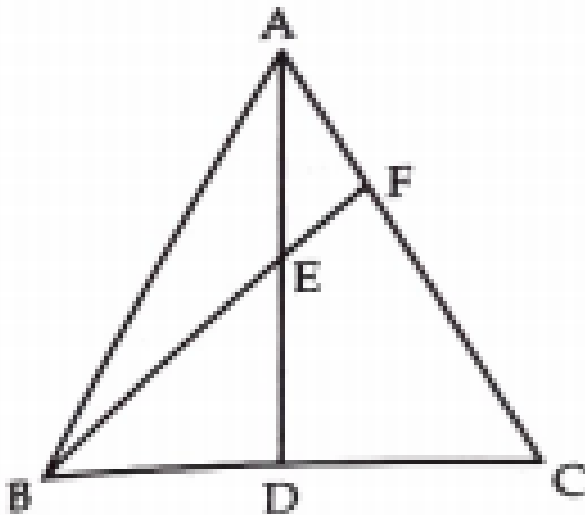
31. Prove that the figure formed by joining the mid-points of the pairs of consecutive sides of a quadrilateral is a parallelogram.



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32. In triangle ABC , AD is the median through A and E is the mid point of AD . BE is produced so as to meet

AC in F. prove that $AF = \frac{1}{3}AC$



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33. ABCD is a parallelogram. P is any point on AD, such that $AP = \frac{1}{3}AD$ and Q is a point on BC such that $CQ = \frac{1}{3}AD$. Prove that AQCP is a parallelogram.



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34. P is the mid point of side AB of a parallelogram ABCD. A line through B parallel to PD meets DC at Q and AD produced at R. prove that $AR=2BC$.



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35. P is the mid point of side AB of a parallelogram ABCD. A line through B parallel to PD meets DC at Q and AD produced at R. prove that $BR=2BQ$.



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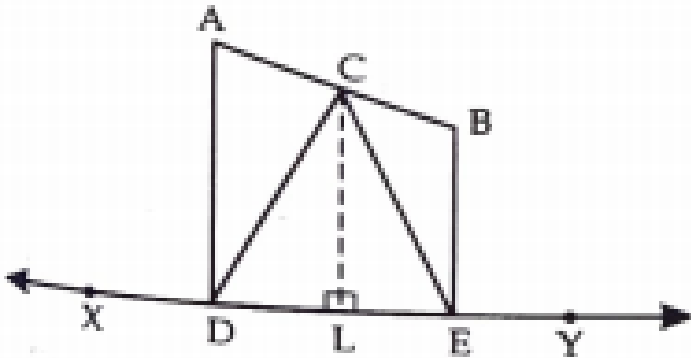
36. Prove that the line joining the mid points of the diagonals of a trapezium is parallel to the parallel sides of the trapezium.



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37. In the fig. two points A and B in on the same side of a line XY. If $AD \perp XY$, $BE \perp XY$ and C is the

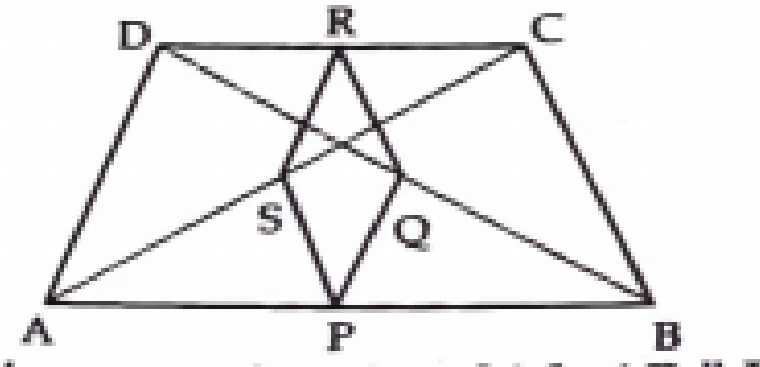
mid point of AB. Prove that $CD=CE$



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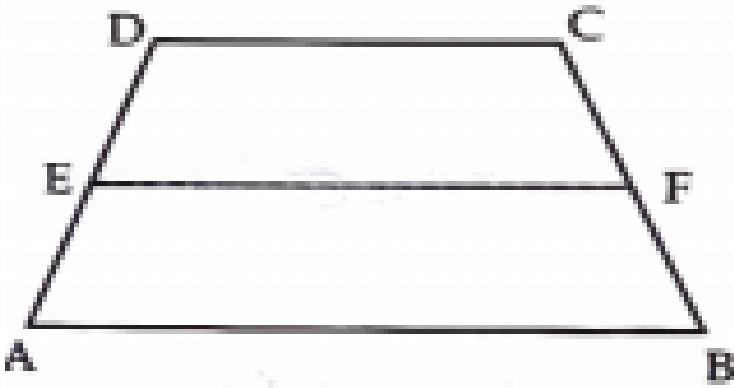
38. In the fig. ABCD is a trapezium in which $AB \parallel DC$ and $AD=BC$. IF P,Q,R,S are respectively the mid points of BA,BD and CD,CA, then show that PQRS is a

rhombus.



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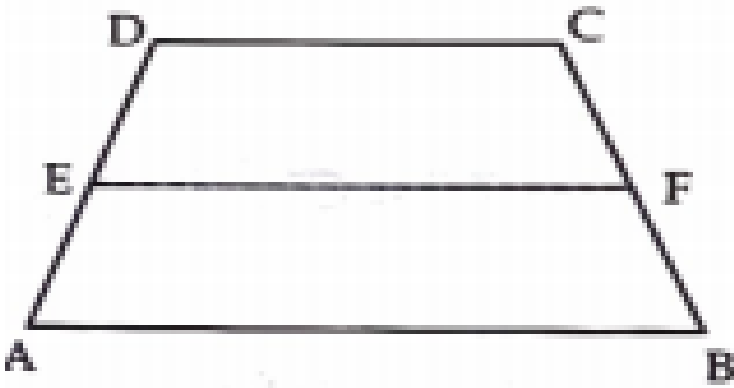
39. ABCD is a trapezium in which $AB \parallel DC$ and let E be the mid point of AD. Let F be a point on BC such that $EF \parallel AB$. Prove that



F is mid point of BC.

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40. ABCD is a trapezium in which $AB \parallel DC$ and let E be the mid point of AD. Let F be a point on BC such that $EF \parallel AB$. Prove that

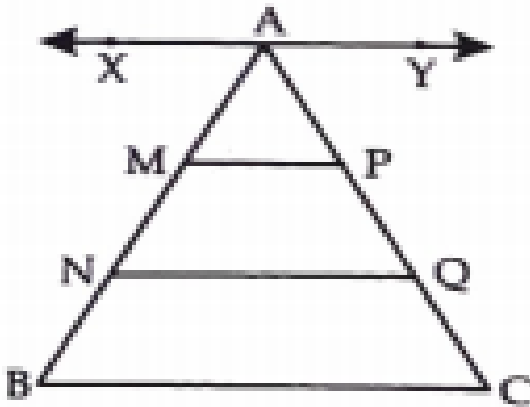


$$EF = \frac{1}{2}(AB + DC)$$

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41. In the fig points M and N divide AB of triangle ABC into three equal parts. Line segments MP and NQ are both parallel to BC and meet AC in P and Q respectively. Prove that P and Q divide AC into three

equal parts



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42. Prove that any line segment drawn from the vertex of a triangle to the base is bisected by the line segment joining the mid points of the other sides of the triangle.

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43. The figure obtained by joining the midpoints of the sides of a rhombus, taken in order, is



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44. Diagonals of the parallelogram bisect each other at right angles .



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45. Name the quadrilateral formed in which two parallel of adjacent sides are of the same length.



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46. In a quadrilateral PQRS, $\angle P + \angle S = 180^\circ$.

Name the type of quadrilateral it is?



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47. In a parallelogram PQRS, write the sum angles of

P and Q.



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48. ABCD is a rectangle with $\angle BCA = 34^\circ$ find $\angle DBC$.



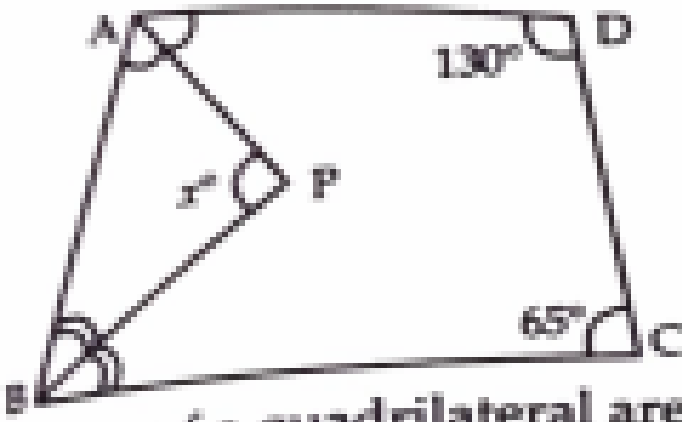
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49. The perimeter of a parallelogram is 24 cm. if the large side measures 7.5 cm, what is the measure of shorter side?



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50. In quadrilateral ABCD, AP and BP are bisector of $\angle A$ and $\angle B$ respectively, then find the value of x



Three angles of a quadrilateral are 110° , 65° and 105° . Find the measure of the fourth angle.

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51. If three angles of a quadrilateral are 110° , 65° and 105° then find the measure of the fourth angle.

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52. Opposite angles of a quadrilateral ABCD are equal. If $AB=4$ cm determine CD.



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53. Can all the angles of a quadrilateral be right angles? Give reasons for your answer.



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54. In a parallelogram PQRS, if $\angle S = 125^\circ$, find the measure of $\angle P$.



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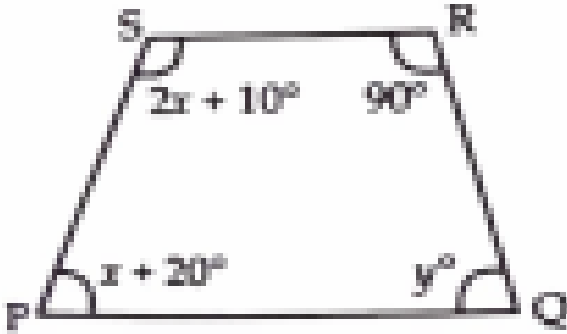
55. If the angles of a quadrilateral are in the ratio 3:5:9:13 , then find the measure of the smallest angle.

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56. In a parallelogram PQRS,
 $\angle P = (3x - 20)^\circ$, $\angle Q = (y + 15)^\circ$, $\angle R = (x + 40)^\circ$
, then find the values of x and y.

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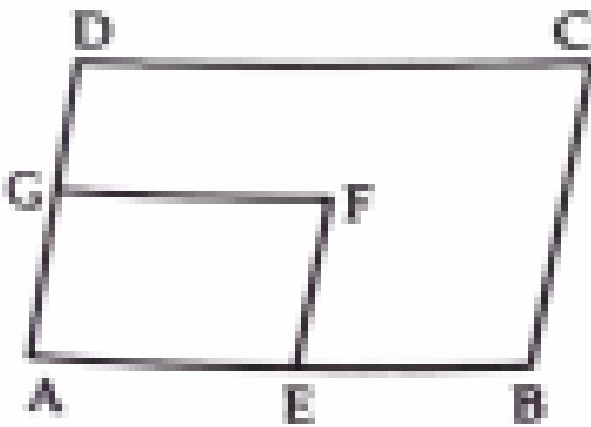
57. In the fig. PQRS is a trapezium. Find the values of x and y



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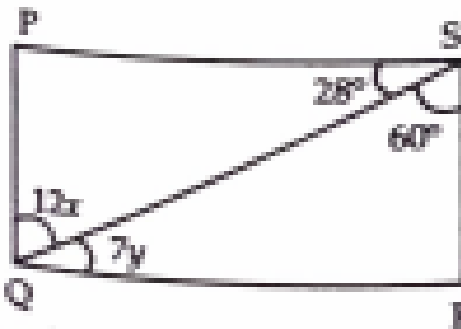
58. In the fig. ABCD and AEFG are the parallelogram if

$\angle C = 58^\circ$, find $\angle F$



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59. PQRS is a parallelogram. Find the values of x and y



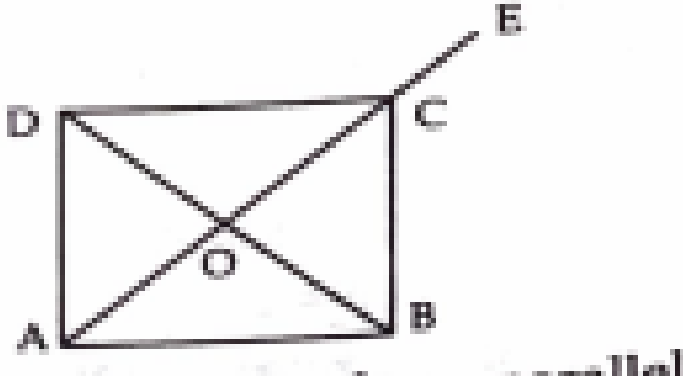
Diagonals of a parallelogram bisect each other.

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60. Diagonals of a parallelogram ABCD intersect at O. if $\angle BOC = 90^\circ$ and $\angle BDC = 50^\circ$. Then find $\angle OAB$.

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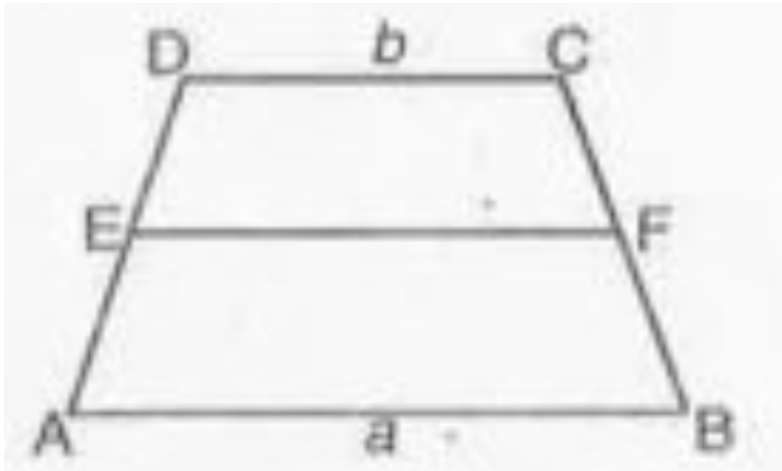
61. In the fig. ABCD is a rectangle in which diagonal AC is produced to E. if $\angle ECD = 146^\circ$ if find $\angle AOB$



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62. ABCD is a trapezium with parallel sides $AB = a$ cm and $DC = 6$ cm E and F are the mid-points of the non-

parallel sides. The ratio of ar (ABFE) and ar (EFCD) is



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63. True/false

If all the sides of quadrilateral are equal, then it is a rhombus.

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64. True/false

Diagonals of a parallelogram are perpendicular to each other.



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65. True/false

All the four angles of a quadrilateral can be obtuse angles.



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66. True/false

Diagonals of a rhombus are perpendicular but unequal.

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67. The figure formed by joining the midpoints of the consecutive sides of a quadrilateral is

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68. True/false

If three angles of quadrilatera are 30° , 80° , 110°

then the fourth angle is 120° .

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69. In a parallelogram, sum of any two adjacent angles is 180° .

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70. True/false

Consecutive angles of a parallelogram are complementary.

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71. True/false

If in a quadrilateral one pair of opposite sides are parallel, the quadrilateral is a rhombus.



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72. True/false

If one angle in a parallelogram is a right angled, then it is necessary a rectangle.



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73. Fill ups

In a parallelogram the opposite sides are..... .



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74. Fill ups

A square, rectangle and rhombus are..... .



[Watch Video Solution](#)

75. Fill ups

In a parallelogrambisect each other.



[Watch Video Solution](#)

 [Watch Video Solution](#)

76. Fill ups

A quadrilateral is a parallelogram if both pairs of opposite angles is..... .



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77. Fill ups

If one pair of opposite sides are equal and parallel, then the figure is.....



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78. Fill ups

Consecutive angles of a parallelogram are..... .



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79. Fill ups

If consecutive sides of a parallelogram are equal,
then it is necessarily a..... .



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**80. The figure formed by joining the midpoints of
the consecutive sides of a quadrilateral is**



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81. The bisectors of angles of a parallelogram form a
:



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82. The angles of a quadrilateral are in the ratio
 $3:4:5:6$. The respective angles of the quadrilateral
are :



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83. In a quadrilateral ABCD, if AO and BO are the bisectors $\angle A$ and $\angle B$ respectively, $\angle C = 70^\circ$ and $\angle D = 30^\circ$ then $\angle AOB =$

A. 60°

B. 80°

C. 50°

D. 100°

Answer:



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84. The figure formed by joining the midpoints of the consecutive sides of a quadrilateral is

A. rectangle

B. square

C. rhombus

D. parallelogram

Answer:



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85. The figure formed by joining the mid points of the adjacent sides of a rectangle is

- A. rhombus
- B. rectangle
- C. parallelogram
- D. square

Answer:



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86. The figure formed by parallelogram is 24° less than twice the smallest angles, then the largest side angle of the paralellogram is

A. 58°

B. 102°

C. 112°

D. 145°

Answer:



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87. Find the measure of all the angles of a parallelogram, if one angle is 24° less than twice of the smallest angle.

A. 58°

B. 102°

C. 112°

D. 145°

Answer:



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88. The consecutive sides of a quadrilateral have

- A. no common point
- B. one common point
- C. infinitely many common points
- D. two common points

Answer:



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89. Which of the following quadrilateral is not a rhombus?

- A. Diagonals bisect opposite angles
- B. All four sides are equal
- C. One angle between the diagonals is 60°
- D. Diagonals bisect each other

Answer:



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90. The bisectors of any two adjacent angles at a parallelogram intersect is

- A. 30°

B. 60°

C. 45°

D. 90°

Answer:



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91. The figure formed by joining the mid points of the adjacent sides of a parallelogram is

A. rhombus

B. square

C. parallelogram

D. rectangle

Answer:



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92. The figure formed by joining the mid points of the adjacent sides of a parallelogram is

A. rectangle

B. square

C. rhombus

D. parallelogram

Answer:



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93. In one angle of a prallelogram is 24° less than the smallest angles, then the measure is largest angle of the parallelogram is

A. 102°

B. 78°

C. 112°

D. 176°

Answer:



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94. ABCD is a parallelogram and E and F are the centroids of triangle ABD and BCD respectively then

EF=

A. AE

B. CE

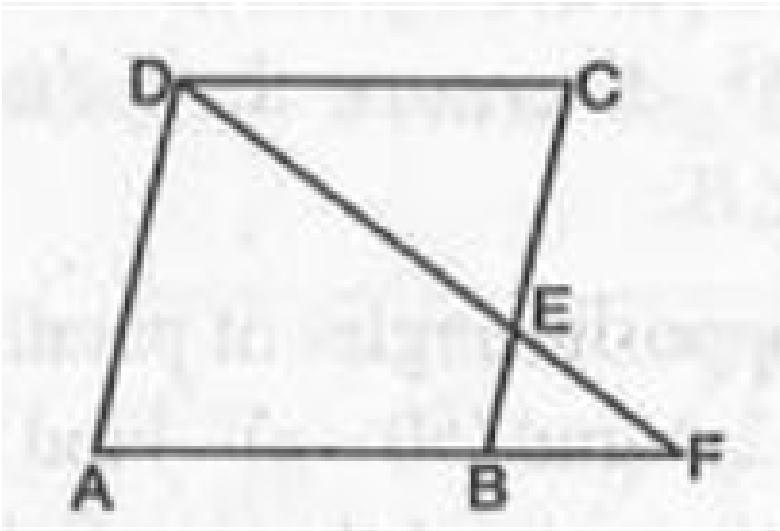
C. DE

D. BE

Answer:

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95. In Fig. .



ABCD is a parallelogram and E is the mid-point of

side BC. If DE and AB, when produced meet at F, prove that $AF = 2AB$.

A. $3AB$

B. $2AB$

C. $\frac{3}{2}AB$

D. $\frac{5}{4}AB$

Answer:



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96. If the degree measures of the angles of quadrilateral are $4x, 7x, 9x$ and $10x$ what is the sum of

the measures of the smallest angle are largest angle?

A. 180°

B. 140°

C. 168°

D. 150°

Answer:



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97. The diagonal AC and BD of a rectangle ABCD intersect each other at P. if $\angle ABD = 50^\circ$ and

$\angle DPC =$

A. 90°

B. 110°

C. 80°

D. 100°

Answer:



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98. ABCD is a rhombus such that $\angle ACB = 40^\circ$.

Then $\angle ADB$ is

A. 45°

B. 70°

C. 50°

D. 60°

Answer:



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99. Diagonals of a parallelogram ABCD intersect at O. if $\angle BOC = 90^\circ$ and $\angle BDC = 50^\circ$. Then find $\angle OAB$.

A. 40°

B. 10°

C. 90°

D. 50°

Answer:



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100. ABCD is a trapezium in which $AB \parallel DC$. M and N are the mid-points of AD and BC respectively. If $AB = 12$ cm, and $MN = 14$ cm, find CD.

A. 14 cm

B. 10 m

C. 12 cm

D. 16 cm

Answer:



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101. D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$. Show that $CA^2 = CB \cdot CD$.

CD.

A. 5cm

B. 9cm

C. 8cm

D. 10cm

Answer:



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102. In the figure ABCD is a parallelogram in which

$\angle BDC = 45^\circ$ and $\angle BAD = 75^\circ$ then $\angle CBD =$

A. 30°

B. 45°

C. 60°

D. 55°

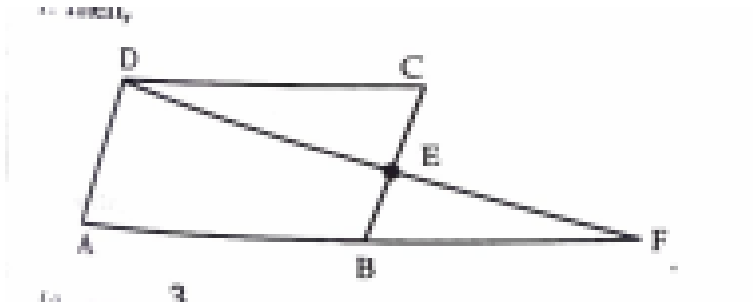
Answer:



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103. In the figure ABCD is a llgm and E is the mid point of BC. Also DE and AB when produced meet at

F then



A. $AF = \frac{3}{2}AB$

B. $AF = 2AB$

C. $AF = \frac{3}{2}AB$

D. $AF^2 = 2AB^2$

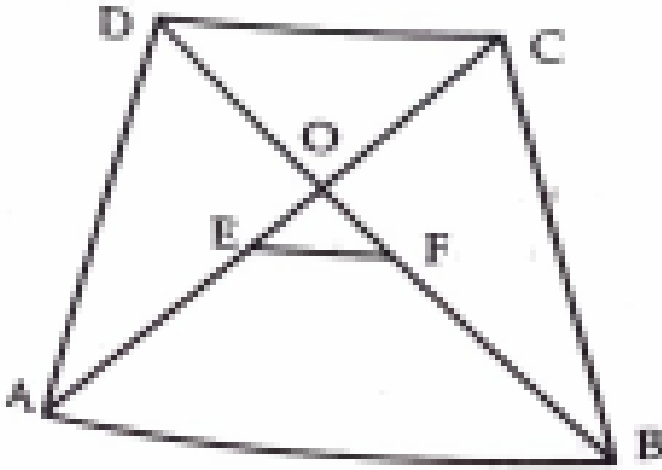
Answer:



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104. In a trapezium ABCD, if E and F be the mid points of the diagonals AC and BD respectively, then

EF=



- A. $\frac{1}{2}AB$
- B. $\frac{1}{2}(AB + CD)$
- C. $\frac{1}{2}CD$
- D. $\frac{1}{2}(AB - CD)$

Answer:



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105. Two parallelograms are on equal bases and between the same parallels. The ratio of their areas is

A. 1 : 3

B. 1 : 2

C. 2 : 1

D. 1 : 1

Answer:



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106. If angles A, B, C and D of the quadrilateral ABCD, taken in order, are in the ratio 3 : 7 : 6 : 4, then ABCD is

A. kite

B. rhombus

C. trapezium

D. parallelogram

Answer:



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107. Three angles of a quadrilateral are 75° , 90° and 75° . The fourth angle is

A. 90°

B. 95°

C. 105°

D. 120°

Answer:





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108. A diagonal of a rectangle is inclined to one side of the rectangle at 25° . The acute angle between the diagonals is

A. 55°

B. 50°

C. 40°

D. 25°

Answer:



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109. ABCD is a rhombus such that $\angle ACB = 40^\circ$.

Then $\angle ADB$ is

A. 40°

B. 45°

C. 50°

D. 60°

Answer:



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110. The quadrilateral formed by joining the mid-points of the sides of a quadrilateral PQRS, taken in order, is a rectangle, if

- A. PQRS is rectangle
- B. PQRS is a paralelogram
- C. diagonals of PQRS are equal
- D. diagonals PQRS are perpendicular

Answer:



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111. The quadrilateral formed by joining the mid-points of the sides of a quadrilateral PQRS, taken in order, is a rhombus, if

- A. PQRS is a rhombus
- B. PQRS is a parallelogram
- C. diagonals of PQRS are equal
- D. Diagonals of PQRS are perpendicular

Answer:



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112. If angles A, B, C and D of the quadrilateral ABCD, taken in order, are in the ratio 3: 7: 6: 4, then ABCD is

- A. rhombus
- B. parallelogram
- C. trapezium
- D. kite

Answer:



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113. If bisectors of $\angle A$ and $\angle B$ of a quadrilateral ABCD intersect each other at P, of $\angle B$ and $\angle C$ at Q, of $\angle C$ and $\angle D$ at R and of $\angle D$ and $\angle A$ at S, then PQRS is a

A. rectangle

B. rhombus

C. parallelogram

D. quadrilateral whose opposite angles are supplementary

Answer:



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114. If APB and CQD are two parallel lines, then the bisectors of the angles APQ , BPQ , CQP and PQD form

- A. a square
- B. a rhombus
- C. a rectangle
- D. any other parallelogram

Answer:



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115. The figure obtained by joining the midpoints of the sides of a rhombus, taken in order, is

- A. a rhombus
- B. a rectangle
- C. a rhombus
- D. a parallelogram

Answer:



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116. D and E are the mid-points of the sides AB and AC of $\triangle ABC$ and O is any point on side BC. O is joined to A. If P and Q are the mid-points of OB and OC respectively, then DEQP is

- A. a square
- B. a rectangle
- C. a rhombus
- D. a parallelogram

Answer:



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117. The figure formed by joining the midpoints of the sides of a quadrilateral ABCD, taken in order, is a square only

A. ABCD is a rhombus

B. diagonals of ABCD are equal

C. Diagonals of ABCD are equal and perpendicular

D. diagonals of ABCD are perpendicular

Answer:



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118. The diagonals AC and BD of a parallelogram ABCD intersect each other at the point O. If $\angle DAC = 32^\circ$ and $\angle AOB = 70^\circ$, then $\angle DBC$ is equal to

A. 24°

B. 86°

C. 38°

D. 32°

Answer:



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119. Which of the following is not true for a parallelogram?

A. opposite sides are equal

B. oppsite angles are equal

C. opposite angles are bisected by the diagonals

D. diagonals bisect each other

Answer:



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120. D and E are the mid-points of the sides AB and AC respectively of $\triangle ABC$. DE is produced to F. To prove that CF is equal and parallel to DA, we need an additional information which is

A. $\angle DAE = \angle EFC$

B. $AE=EF$

C. $DE=EF$

D. $\angle ADE = \angle ECE$

Answer:



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121. The length of the diagonals of a rhombus are 24 cm and 32 cm. the perimeter of the rhombus is

- A. 49 cm
- B. 128 cm
- C. 80 cm
- D. 56 cm

Answer:



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122. Prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.

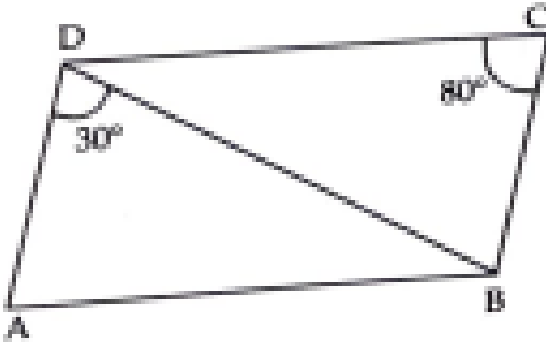
- A. diagonals
- B. angles
- C. opposite sides
- D. none of these

Answer:



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123. In the fig. ABCD is a parallelogram if $\angle ADB = 30^\circ$ and $\angle DCB = 80^\circ$ then find $\angle DBA$



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124. In a parallelogram PQRS, write the sum angles of P and Q.

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125. The angles of a quadrilateral are in the ratio 1:3:5:6 find the greatest angles.



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126. ABCD is a rectangle in which diagonal AC bisects $\angle A$ as well as $\angle C$. Show that ABCD is a square.



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127. State and prove mid point theorem.



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128. The figure formed by joining the mid points of the adjacent sides of a parallelogram is



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129. E and F are points on diagonals AC of a parallelogram ABCD such that $AE=CF$. show that BFC parallelogram



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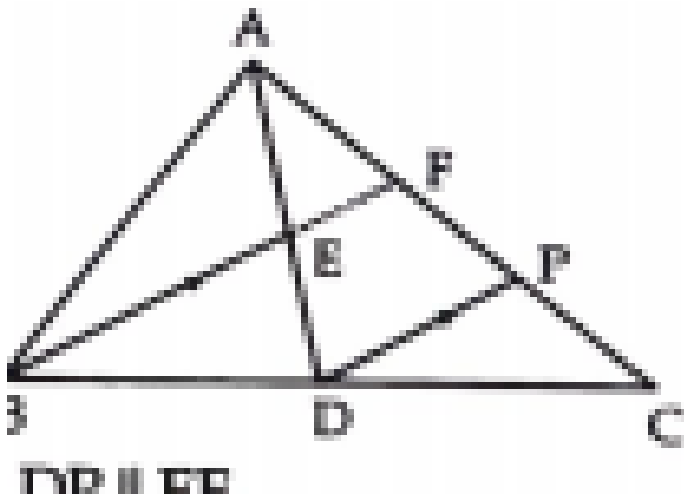
130. If the length of the side of a rhombus is equal to the length of one diagonal Find the angles of the rhombus .



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131. In the fig. AD is a median of triangle ABC and E is the mid point of AD, also BE meets AC in F. prove

that $AF = \frac{1}{3}AC$



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132. ABCD is a rectangle and P, Q, R and S are the mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus.

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133. ABCD is a quadrilateral in which $AB \parallel DC$ and $AD=BC$. Prove that $\angle A = \angle B$ and $\angle C = \angle D$.



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