MATHS

BOOKS - MBD

Quadrilaterals

Exercise

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

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2. A quadrilateral is a parallelogram, if its one pair of opposite sides are equal and parallel.

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3. The diagonals of a rectangle are of the equal length.

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

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5. If the diagonals of a parallelogram are perpendicular, then it is a rhombus.

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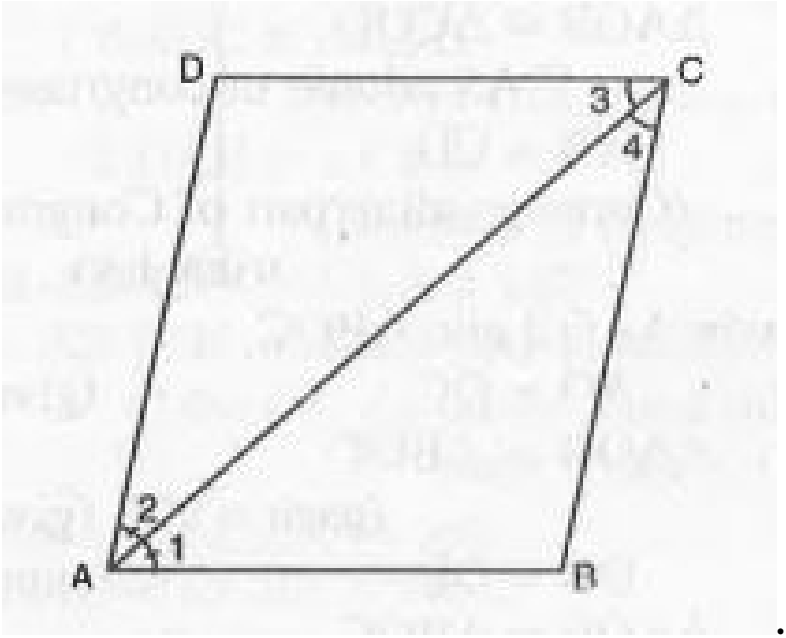
6. Diagonal AC of a parallelogram ABCD bisects $\angle A$ (See fig.)



. Show that It bisects $\angle C$ also.

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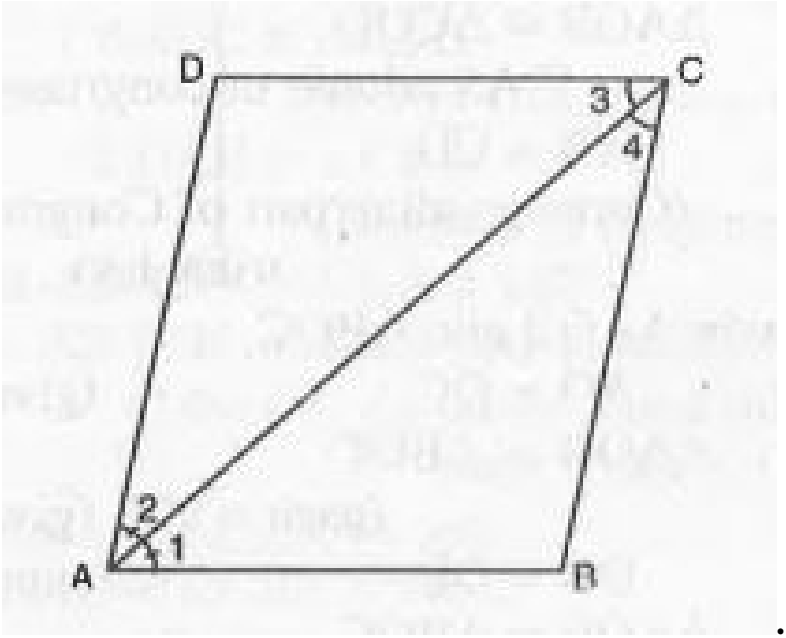
7. Diagonal AC of a parallelogram ABCD bisects $\angle A$ (See fig.)



. Show that ABCD is a rhombus.

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8. 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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9. ABCD is a rectangle in which diagonal AC bisects $\angle Aaswellas/\_C`$. Show that ABCD is a square.

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10. ABCD is a rectangle in which diagonal AC bisects $\angle Aaswellas/\_C$. $Showt\widehat{D}iagonalBDbi\sec ts \perp h/\_B$ $aswellas/\_D$`.

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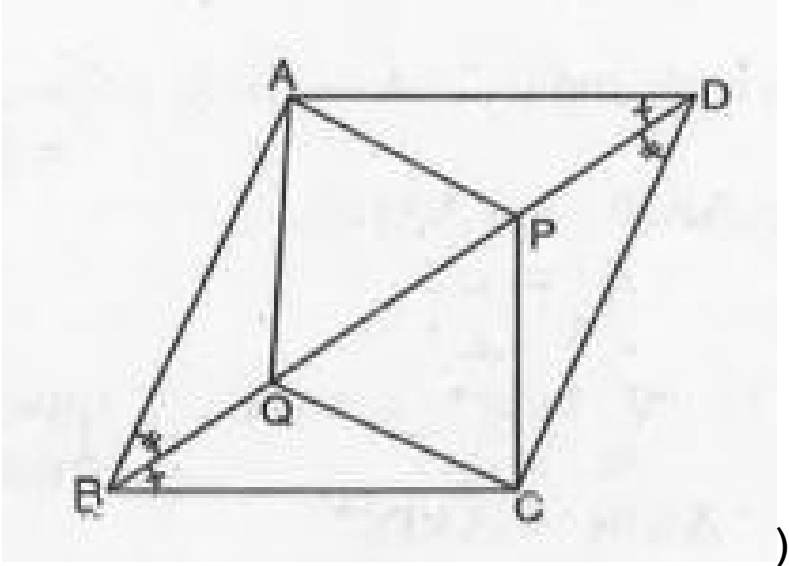
11. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP = BQ (see Fig.



) Show that $\Delta APD \cong \Delta CQB$.

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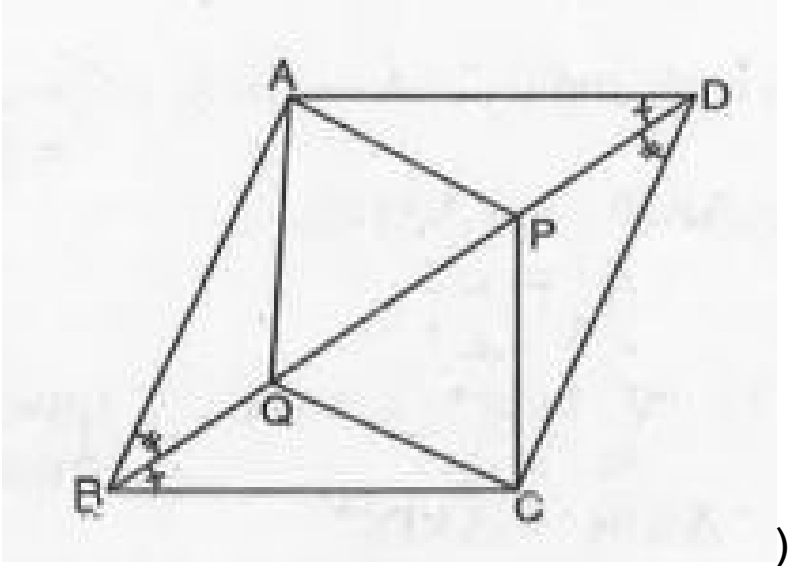
12. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP = BQ (see Fig.



) Show that $AQ = CP$.

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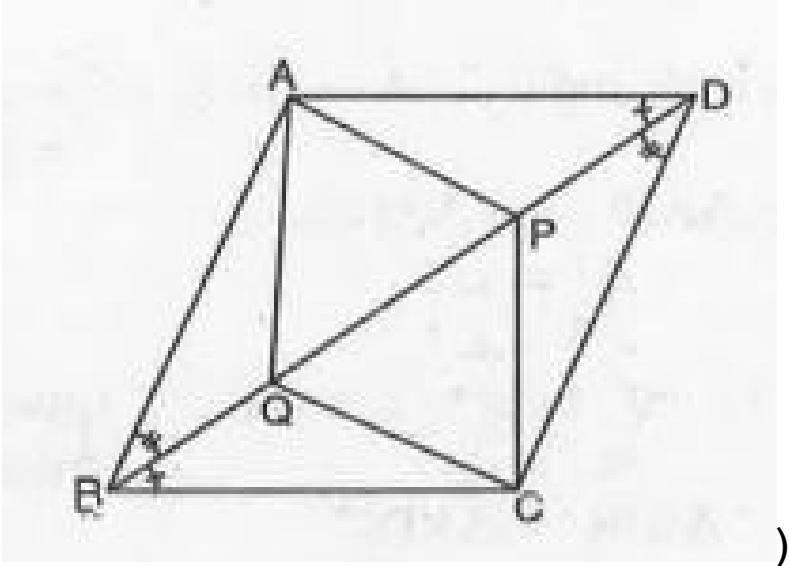
13. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP = BQ (see Fig.



) Show that $\Delta AQB \cong \Delta CPD$.

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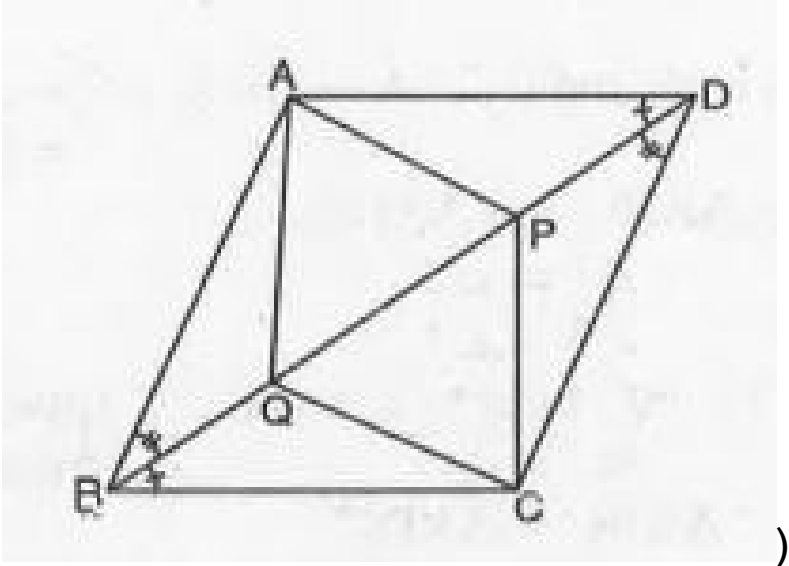
14. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP = BQ (see Fig.



) Show that $AQ = CP$.

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

(see Fig.

) Show that APCQ is a parallelogram.

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16. ABCD is a parallelogram and AP and CQ are the perpendiculars from vertices A and C on its diagonal BD (See fig.) Show that $\Delta APB \cong \Delta CQD$.

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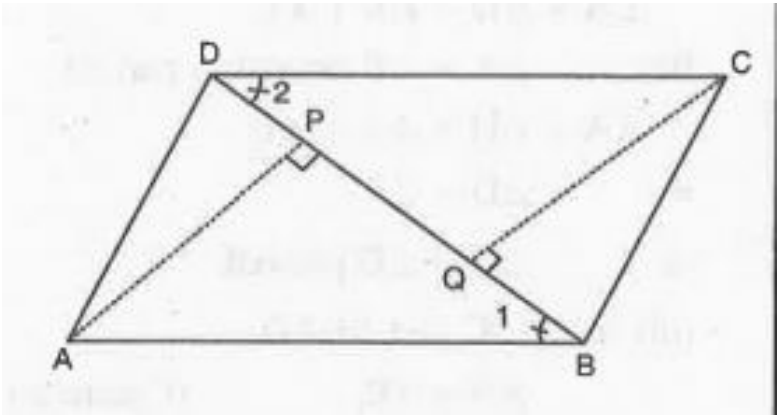
17. ABCD is a parallelogram and AP and CQ are the perpendiculars from vertices A and C on its diagonal BD (See fig.)



Show that AP = CQ.

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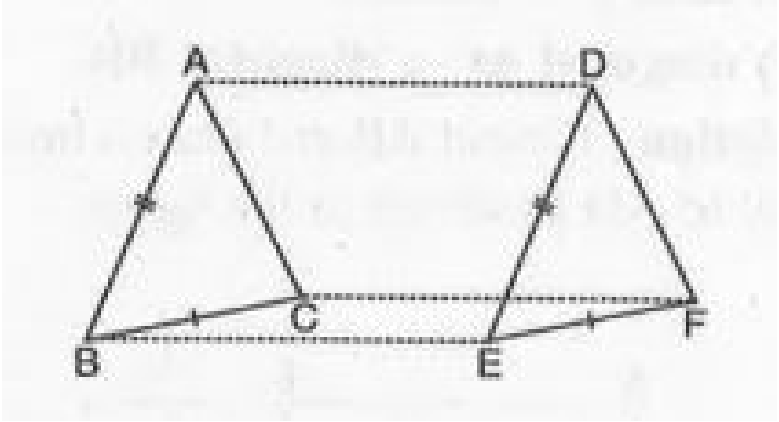
18. In ΔABC and ΔDEF, AB = DE, $AB \parallel DE$, BC = EF and $BC \parallel EF$. Vertices A, B and C are joined to vertices D, E and F respectively (See fig.)



Show that quadrilateral ABED is a parallelogram.

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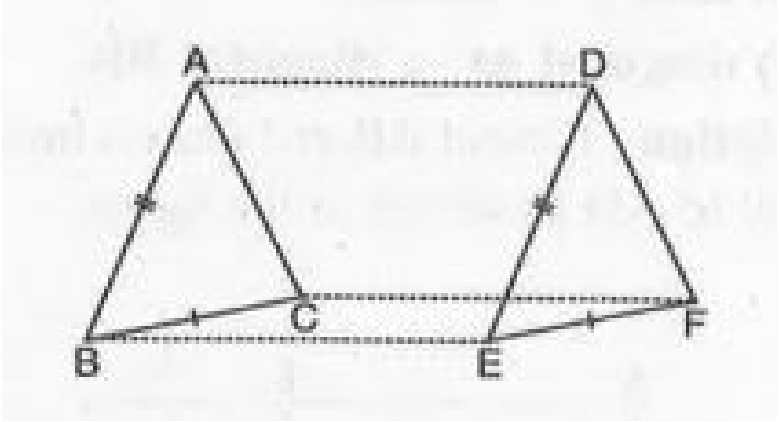
19. In ΔABC and ΔDEF, AB = DE, $AB \parallel DE$, BC = EF and $BC \parallel EF$. Vertices A, B and C are joined to vertices D, E and F respectively (See fig.)



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

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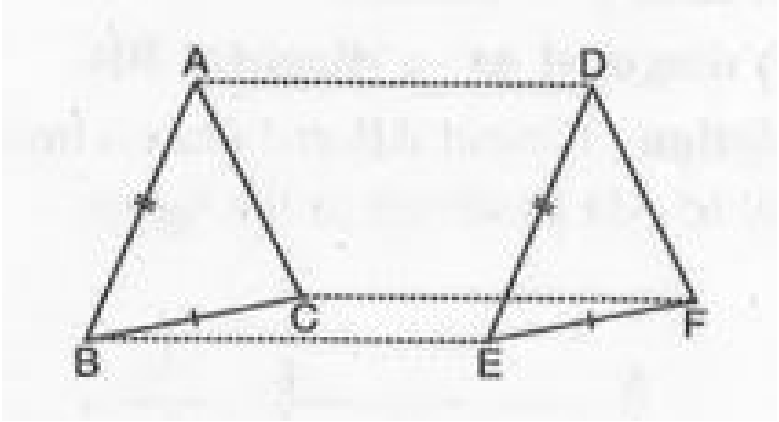
20. In ΔABC and ΔDEF, AB = DE, $AB \parallel DE$, BC = EF and $BC \parallel EF$. Vertices A, B and C are joined to vertices D, E and F respectively (See fig.)



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

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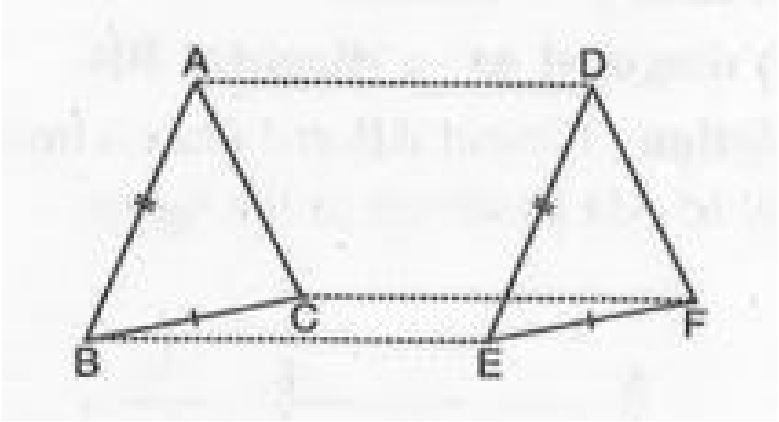
21. In ΔABC and ΔDEF, AB = DE, $AB \parallel DE$, BC = EF and $BC \parallel EF$. Vertices A, B and C are joined to vertices D, E and F respectively (See fig.)



Show that quadrilateral ACFD is a parallelogram.

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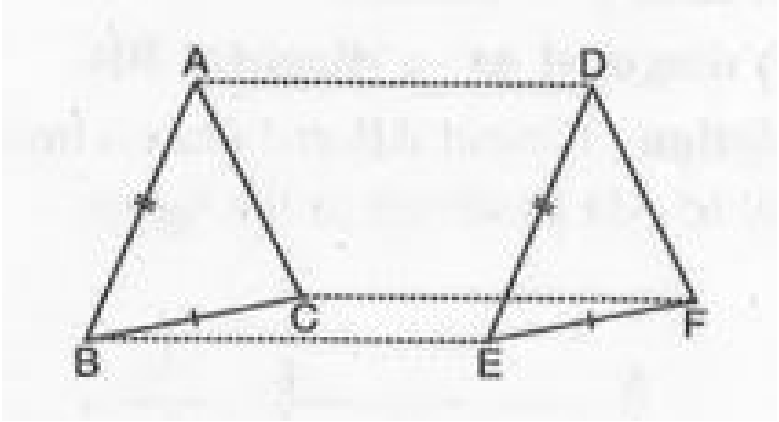
22. In ΔABC and ΔDEF, AB = DE, $AB \parallel DE$, BC = EF and $BC \parallel EF$. Vertices A, B and C are joined to vertices D, E and F respectively (See fig.)



Show that AC=DF.

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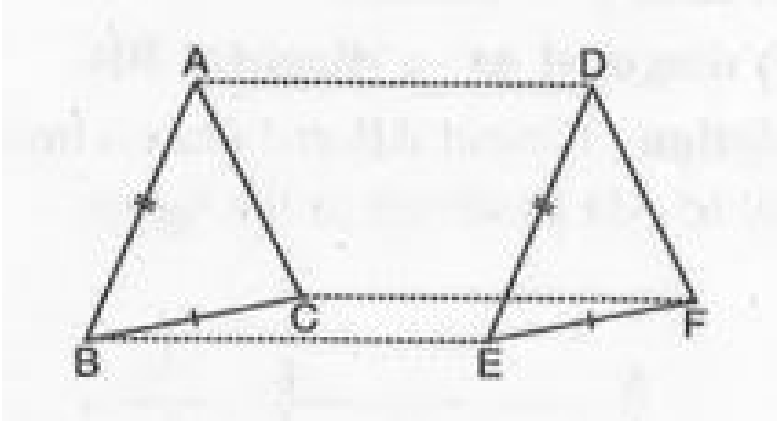
23. In ΔABC and ΔDEF, AB = DE, $AB \parallel DE$, BC = EF and $BC \parallel EF$. Vertices A, B and C are joined to vertices D, E and F respectively (See fig.)



Show that $\Delta ABC \cong \Delta DEF$.

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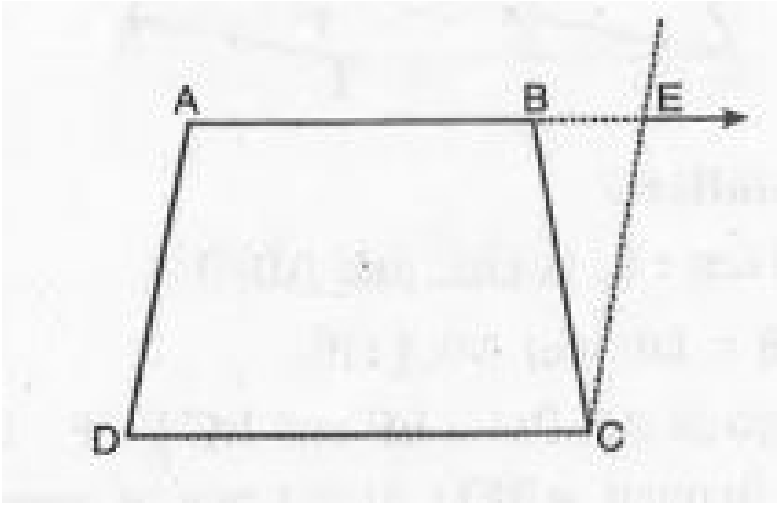
24. ABCD is a trapezium in which $AB \mid\mid CD$ and AD = BC (See Fig.)



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

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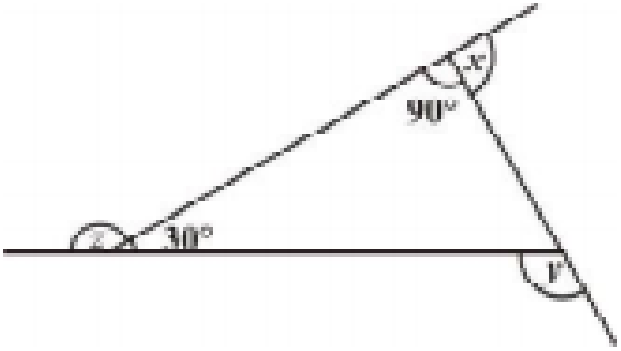
25. Find x+y+z



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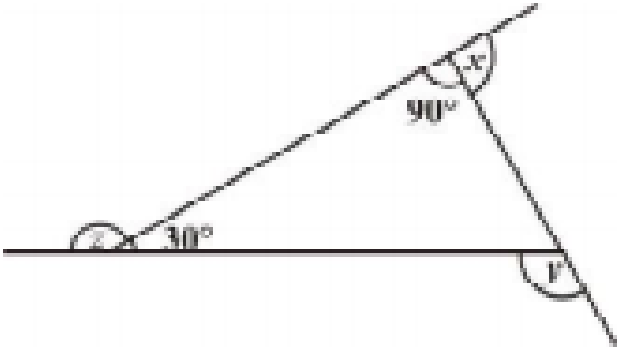
26. Find x+y+z



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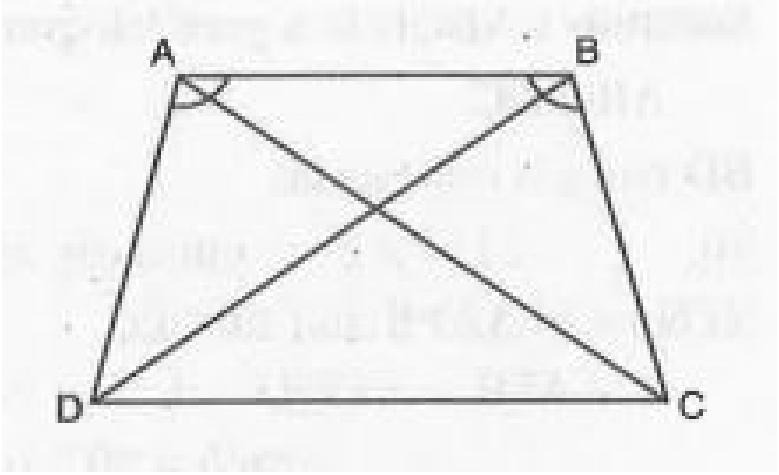
27. ABCD is a trapezium in which $AB \| CD$ and AD = BC (See Fig.)



Show that diagonal AC = diagonal BD.

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28. In a parallelogram ABCD, $\angle D = 115^\circ$, determine the measure of $\angle A$ and /_B`.

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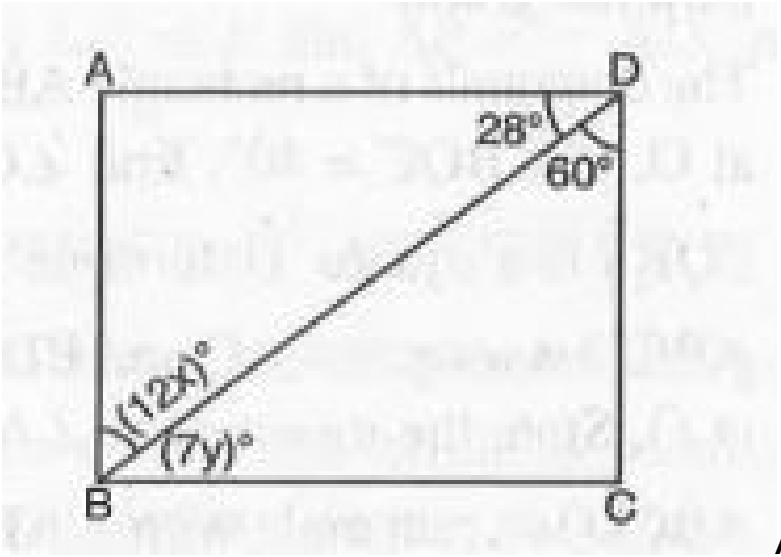
29. In Fig.



ABCD is a parallelogram, compute the values of x and y.

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

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31. In a parallelogram ABCD, diagonals AC and BD intersect at O and AC = 6.8 cm and BD = 5.6 cm. Find the measure of OC and OD.

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32. In a parallelogram ABCD, the bisector of $\angle A$ also bisects BC at X. Prove that AD = 2AB.

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

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

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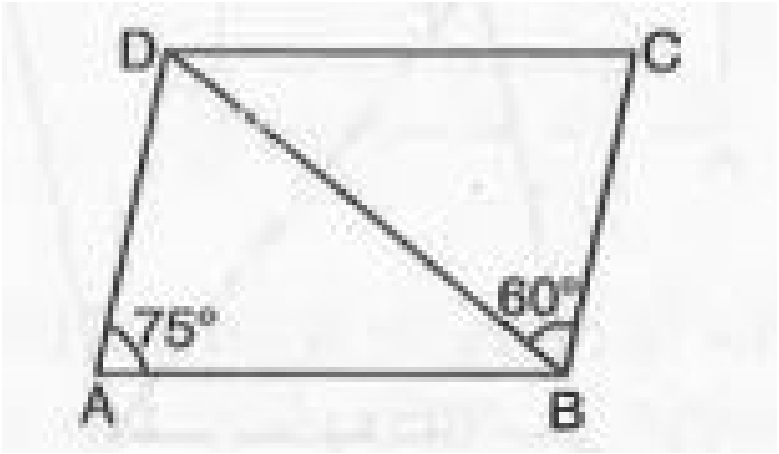
35. In Fig.



ABCD is

a parallelogram in which $\angle DAB = 75^\circ$ and $\angle DBC = 60^\circ$. Compute $\angle CDB$ and $\angle ADB$.

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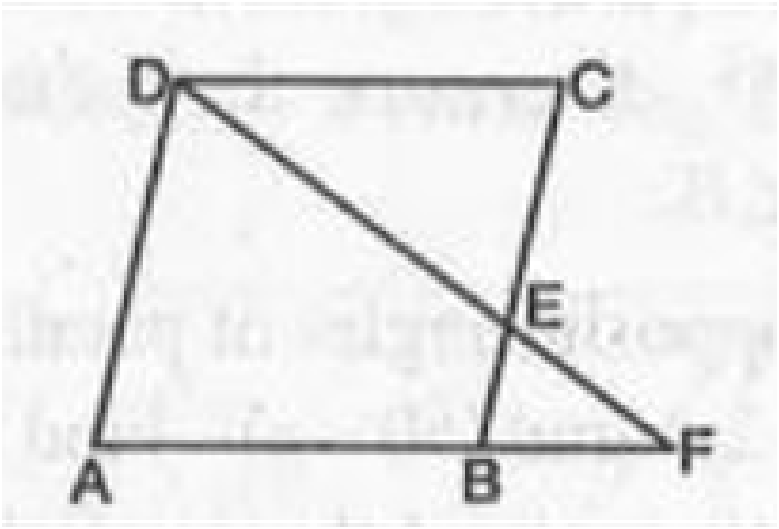
36. In Fig. .



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

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38. If ABCD is a quad, in which $AB \| CD$ and AD = BC. Prove that $\angle A = \angle B$.

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39. 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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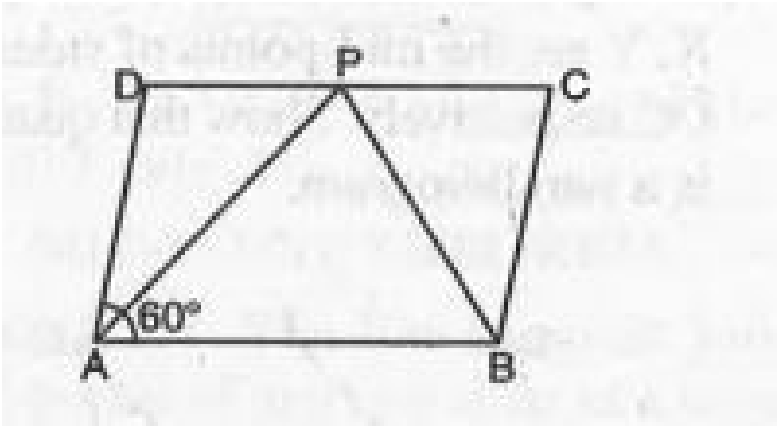
40. In Fig.



ABCD is a parallelogram in which $\angle A = 60^\circ$. If the bisector of $\angle A$ and $\angle B$ meet at P prove that AD = DP, PC = BC and AC = 2AD.

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41. PQRS is a parallelogram. PX and QY are respectively, the perpendiculars from P and Q to SR and RS produced. Prove that PX = QY.

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42. The line drawn through the mid-points of one side of a triangle, parallel to another side, intersects the third side at its midpoint.

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43. If there are three parallel lines, and the intercepts made by them on one transversal are equal, then the intercepts on any other transversal are also equal.

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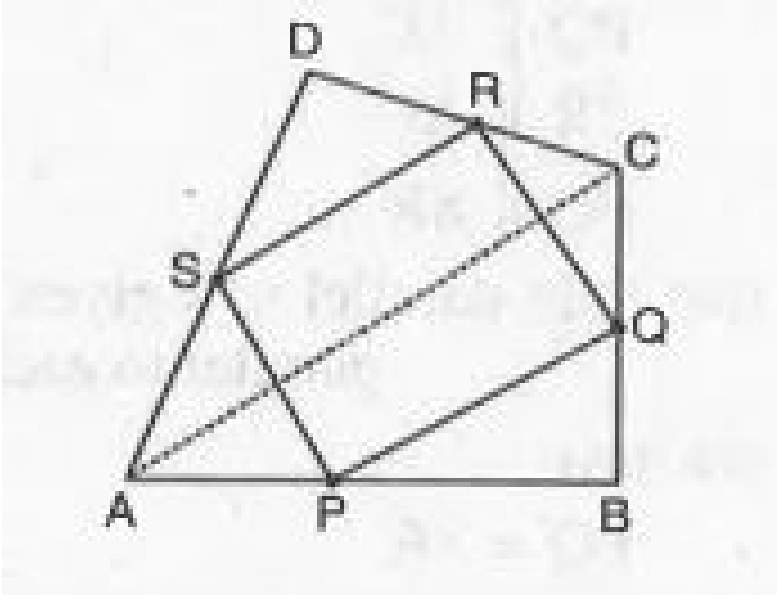
44. ABCD is a quadrilateral in which P, Q, R and S are the mid-points of sides AB, BC, CD and DA respectively (See Fig.



AC is a diagonal Show that $SRIIAC$ and $SR = \frac{1}{2}AC.$

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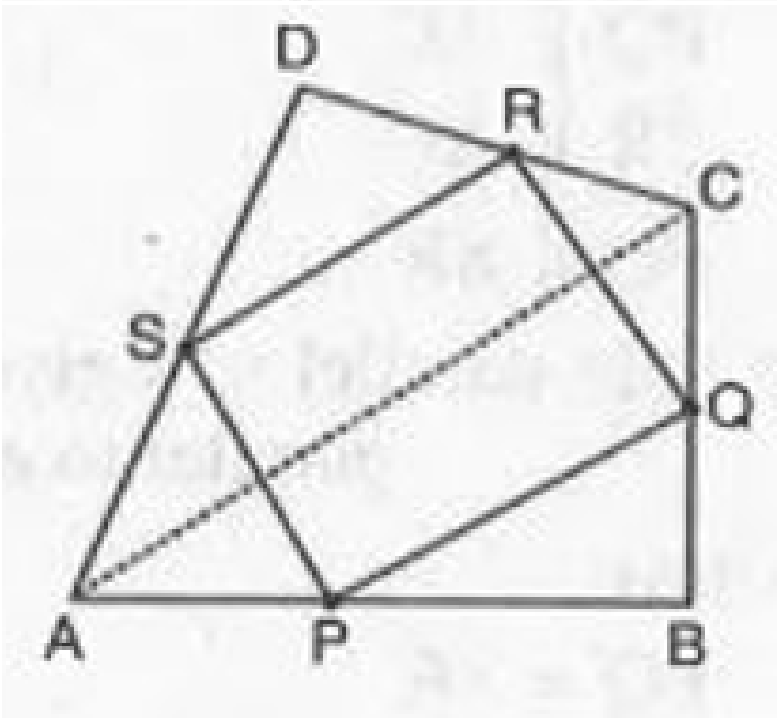
45. ABCD is a quadrilateral in which P, Q, R and S are the mid-points of sides AB, BC, CD and DA

respectively (See Fig.)



AC is a diagonal Show that PQ = SR.

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46. ABCD is a quadrilateral in which P, Q, R and S are the mid-points of sides AB, BC, CD and DA respectively (See Fig.)

 AC is a diagonal Show that PQRS is a parallelogram.

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47. 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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48. 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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49. ABCD is a trapezium with AB II DC, E and F are paints on non-parallel sides AD and BC respectively such that EF is parallel to AB Show

that $\frac{AE}{ED} = \frac{BF}{FC}$.

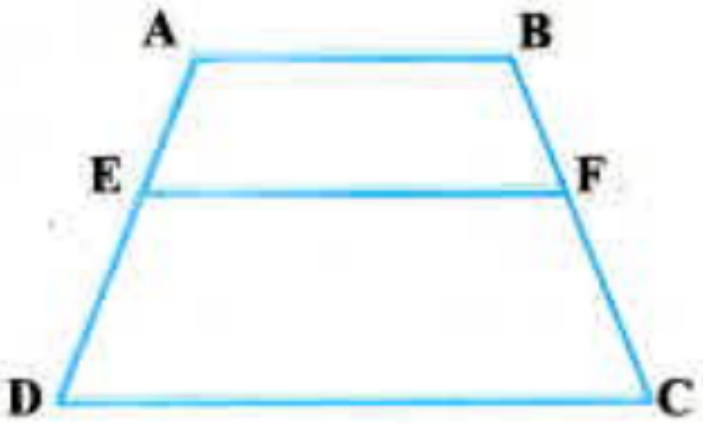

Fig. 6.14

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50. Match the following :

(*i*)	sin (90°–A)	(*a*)	Sin A
(*ii*)	Cos 0°	(*b*)	0
(*iii*)	Sin 0°	(*c*)	1
(*iv*)	Cas (90°–A)	(*d*)	Cos A

.

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

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52. 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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53. 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 $MD \perp AC$.

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54. 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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55. 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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56. In a triangle, P, Q and R are mid-points of sides BC, CA and AB respectively. If AC = 21 cm, BC = 29 cm and AB = 30 cm, find the perimeter of the quadrilateral ARPQ.

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57. In a ΔABC median AD is produced to X such that AD = DX. Prove that ABXC is a parallelogram.

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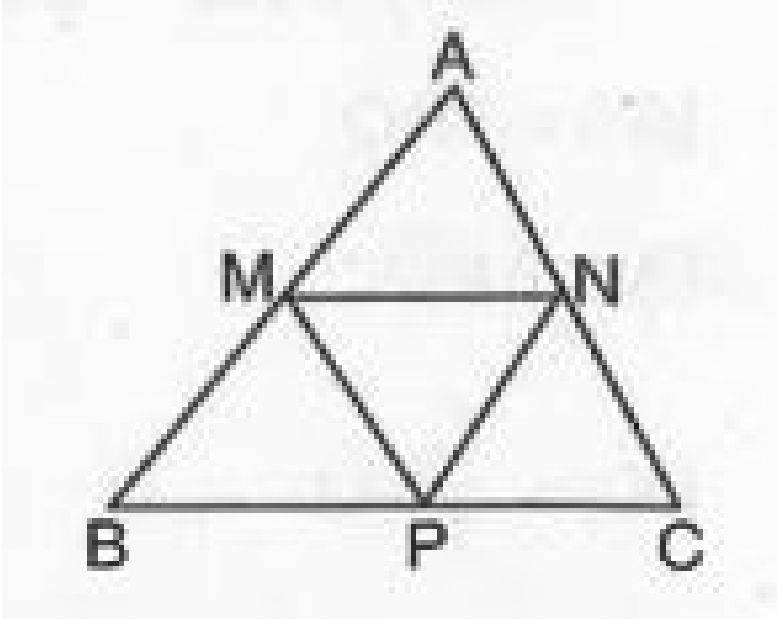
58. In Fig.



M, N and P are the mid-points of AB, AC and BC respectively. If MN = 3 cm, NP = 3.5 cm, and MP = 2.5 cm, calculate BC and AB and AC.

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59. 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.

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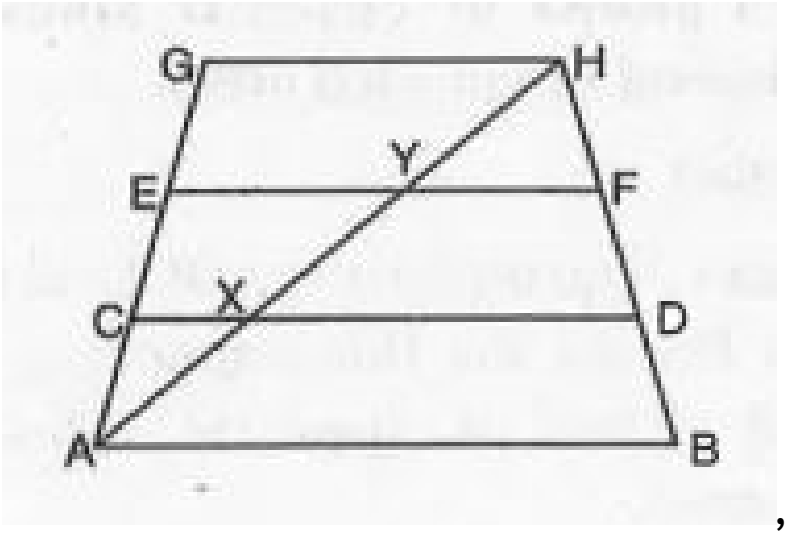
60. In Fig.



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$AB||CD||EF$ | | GH and AX = XY=YH. If AC = 1.5 cm., find AG.

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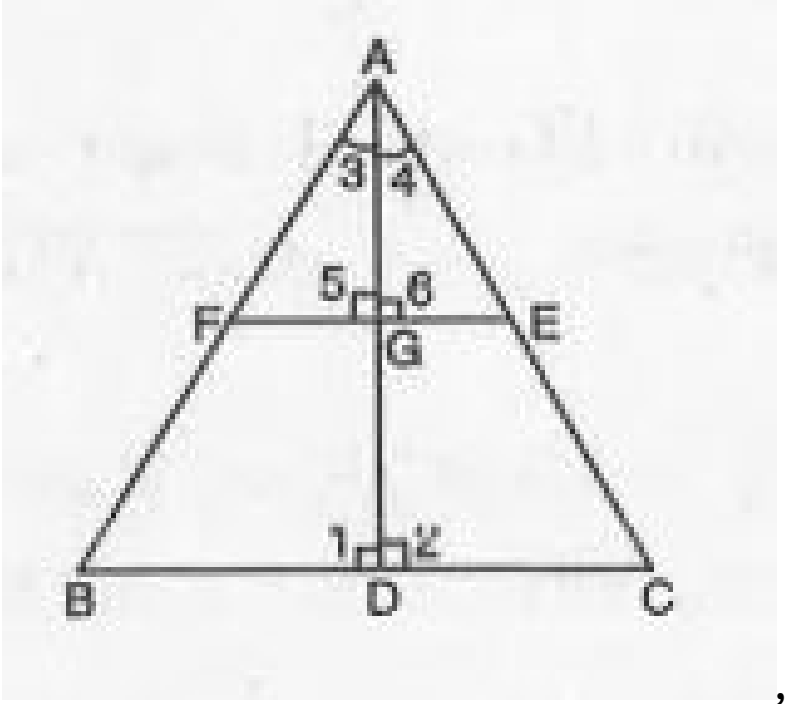
61. In given Fig.



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ΔABC is isosceles with AB = AC. D, E, F are the mid-points of sides BC, AC and AB respectively. Show that the line segment AD is perpendicular to the line segment EF and is bisected by it.

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62. In ΔABC, E and F are the mid-points of AC and AB respectively. The altitude AP to BC intersects FE at Q. Prove that AQ = QP.

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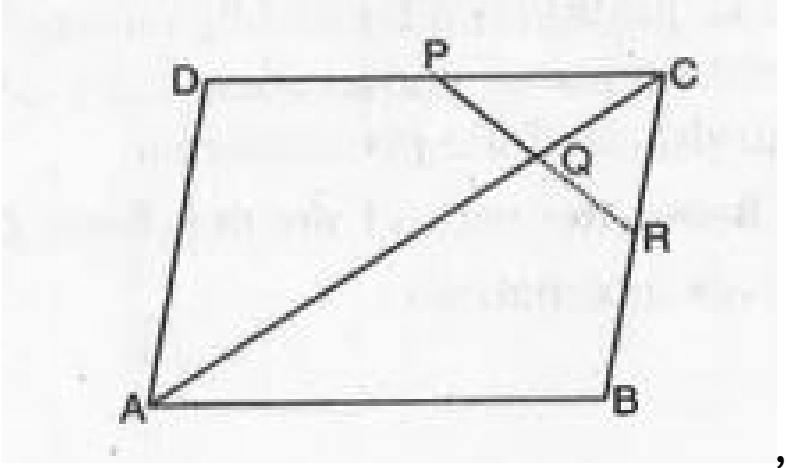
63. In Fig.



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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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64. 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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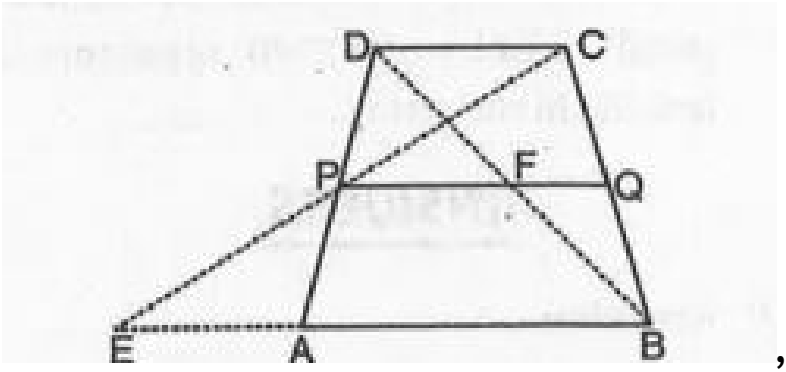
65. In Fig.



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ABCD is a trapezium in which $AB \| DC$ and

P, Q are mid-points of AD and BC respectively. If CP and BA when produced meet at E, prove that $PQ \| DC$.

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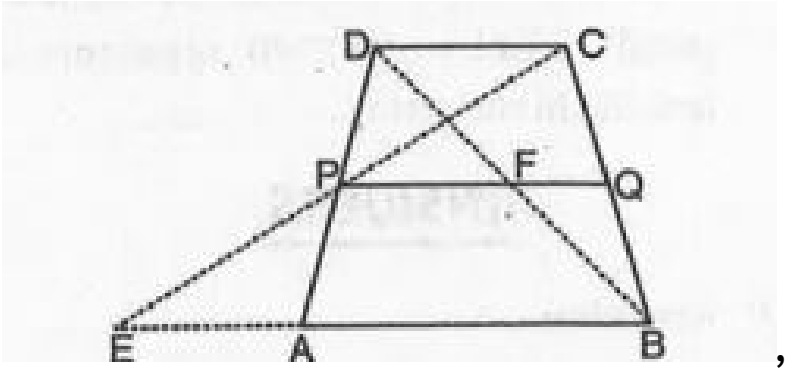
66. In Fig.



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ABCD is a trapezium in which $AB \| DC$ and P, Q are mid-points of AD and BC respectively. If

CP and BA when produced meet at E, prove that $PQ \| DC$.

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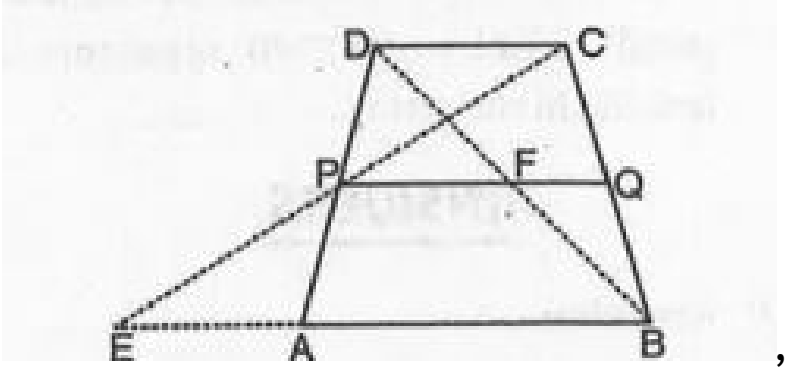
67. In Fig.



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ABCD is a trapezium in which $AB \| DC$ and P, Q are mid-points of AD and BC respectively. If

CP and BA when produced meet at E, prove that $PQ = \frac{1}{2}(AB + DC)$.

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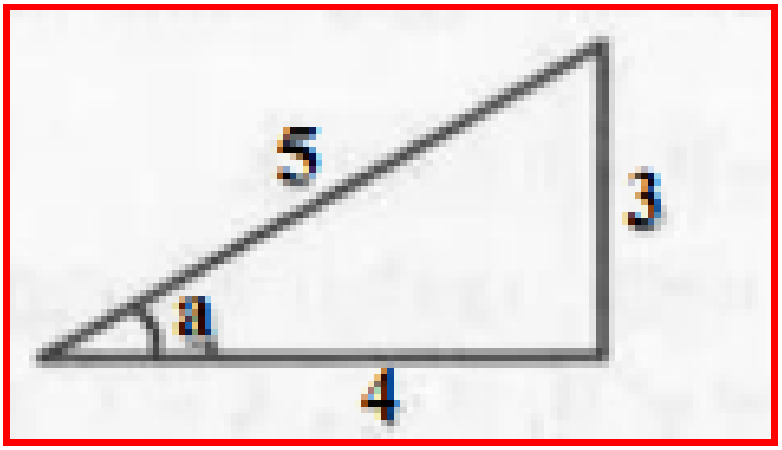
68. What is the value of $\sin a$.



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69. The triangle formed by joining the midpoints of the sides of an isosceles triangle is ..... .

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70. The triangle formed by joining the midpoints of the sides of a right triangle is ..... .

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

72. If a line is divided by three parallel lines into two segments of lengths in the ratio $1:3$ another line will be divided by these parallel lines into two segments of lengths in the ratio ..... .

73. The bisectors of angles of a parallelogram from a :

A. Trapezium

B. Rectangle

C. Rhombus

D. Kite.

Answer:

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

A. $60^\circ, 80^\circ, 100^\circ, 120^\circ$

B. $120^\circ, 100^\circ, 80^\circ, 60^\circ$

C. $120^\circ, 60^\circ, 80^\circ, 100^\circ$

D. $80^\circ, 100^\circ, 120^\circ, 60^\circ$.

Answer:

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

A. Parallelogram

B. Square

C. Rhombus

D. Trapezium.

Answer:

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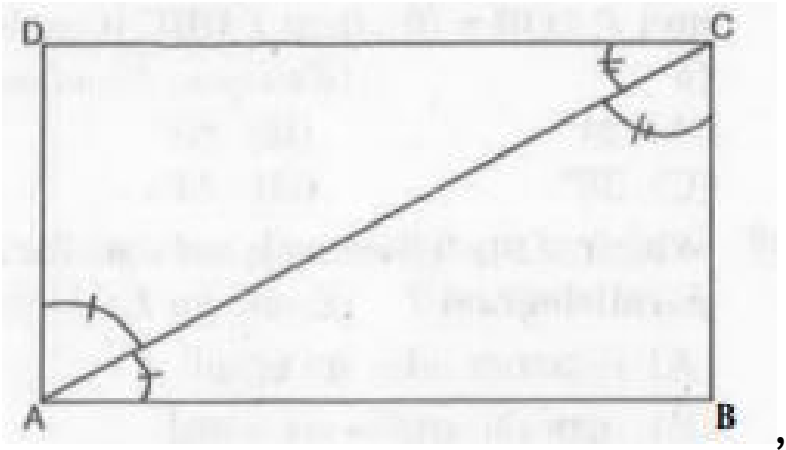
76. If in rectangle ABCD



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diagonal AC bisects $\angle A$ as well as $\angle C$, then ABCD is a :

A. Trapezium

B. Rhombus

C. Parallelogram

D. Square.

Answer:

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77. The line-segment joining the mid-points of two sides of a triangle is parallel to the third side and ..... Of it.

A. Half

B. one third

C. equal

D. one fourth.

Answer:

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78. Line segment joining the mid-points of the opposite sides of a quadrilateral ..... each other.

A. Trisect

B. Bisect

C. Overlap

D. None.

Answer:

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79. Three angles of a quadrilateral are $75^\circ, 90^\circ$ and 75°. The fourth angle is

A. 90°

B. 95°

C. 105°

D. 120°.

Answer:

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80. 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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81. 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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82. 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 a rectangle

B. PQRS is an parallelogram

C. diagonals of PQRS perpendicular

D. diagonals of PQRS are equal.

Answer:

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83. 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 perpendicular

D. diagonals of PQRS are equal.

Answer:

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84. 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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85. 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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86. 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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87. 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 square

D. any parallelogram.

Answer:

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88. Dand E are the mid-points of the sides AB and AC of ΔABC 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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89. 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 perpendicular.

Answer:

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

A. opposite sides are equal

B. opposite angles are equal

C. opposite angles are bisected by the diagonals

D. diagonals bisect each other.

Answer:

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92. D and E are the mid-points of the sides AB and AC respectively of ΔABC. 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. $\angle ADE = \angle ECF$.

Answer:

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