



MATHS

BOOKS - ICSE

MID-POINT THEOREM

3 Marks Question

1. D, E and F are the mid-points of the sides AB, BC and CA of an isosceles triangle ABC in

which $AB = BC$. Prove that $\triangle DEF$ is also isosceles.



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2. D, E and F are the mid-points of the sides AB, BC and CA respectively of $\triangle ABC$. AE meets DF at O. P and Q are the mid-points of OB and OC respectively. Prove that DPOF is a parallelogram.



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3. In triangle ABC, P is the mid-point of side BC.

A line through P and parallel to CA meets AB

at point Q and a line through Q and parallel to

BC meets median AP at point R. Prove that :

$$AP = 2AR$$



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4. In triangle ABC, P is the mid-point of side BC.

A line through P and parallel to CA meets AB

at point Q and a line through Q and a line

through Q and parallel to BC meets median AP

at point R. Prove that :

$$BC = 4QR.$$



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5. In trapezium ABCD, AB is parallel to DC. P and Q are the mid-points of AD and BC respectively. BP produced meets CD produced at point E. Prove that :

Point P bisects BE,



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6. In trapezium ABCD, AB is parallel to DC. P and Q are the mid-points of AD and BC respectively. BP produced meets CD produced at point E. Prove that :

PQ is parallel to AB.



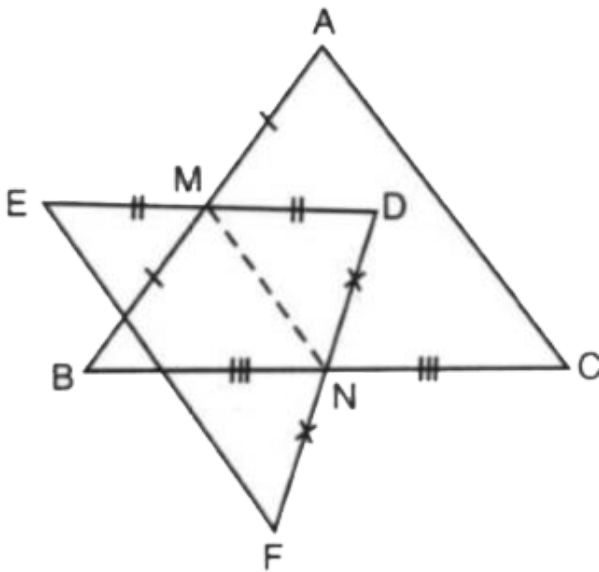
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7. In a triangle ABC, AD is a median and E is mid-point of median AD. A line through B and E meets AC at point F.



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8. In the given figure, M is mid-point of AB and DE, whereas N is mid-point of BC and DF. Show that : $EF = AC$.



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9. In triangle ABC , the medians BP and CQ are produced upto points M and N respectively such that $BP = PM$ and $CQ = QN$. Prove that:
 M, A and N are collinear.



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10. In triangle ABC , the medians BP and CQ are produced upto points M and N respectively such that $BP = PM$ and $CQ = QN$. Prove

that :

A is the mid-point of MN.



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11. In triangle ABC, M is mid-point of AB, N is mid-point of AC and D is any point in base BC. Use Intercept Theorem to show that MN bisects AD.



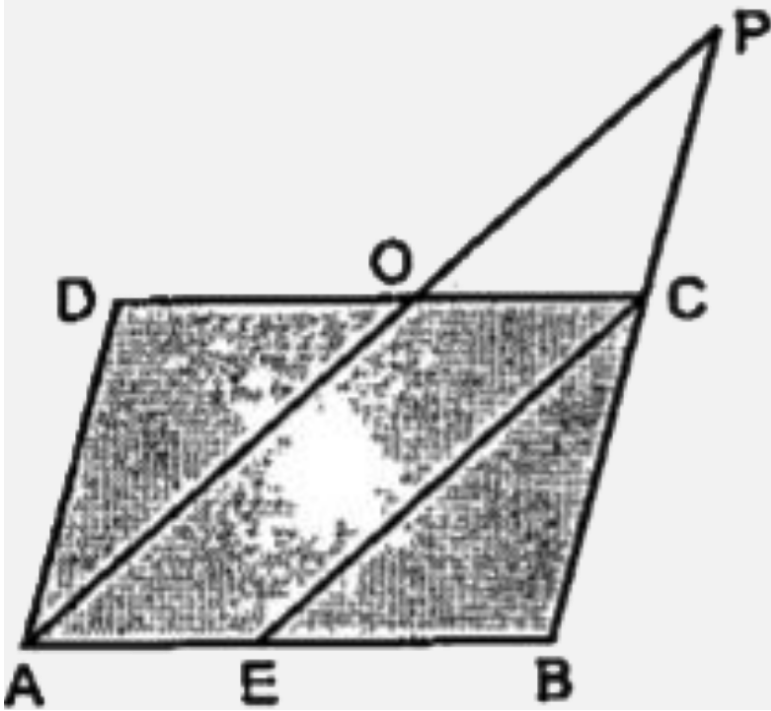
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12. In the given figure, AD and CE are medians and $DF \parallel CE$. Prove that : $FB = \frac{1}{4}AB$.



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13. In parallelogram ABCD, E is the mid-point of AB and AP is parallel to EC which meets DC at point O and BC produced at P. Prove that :

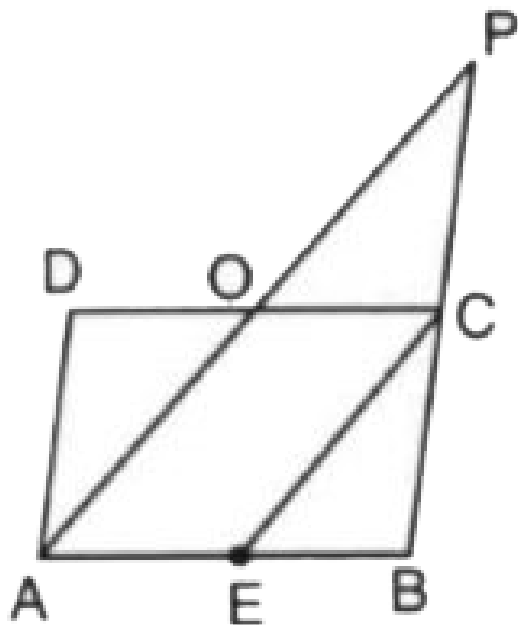


$$BP = 2AD$$

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14. In parallelogram ABCD, E is the mid-point of AB and AP is parallel to EC which meets DC at

point O and BC produced at P. Prove that:



O is mid-point of AP.



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4 Marks Question

1. Prove that the figure obtained by joining the mid-points of the adjacent sides of a rectangle is a rhombus.



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2. The diagonals of a quadrilateral intersect at right angles. Prove that the figure obtained by joining the mid-points of the adjacent sides of the quadrilateral is a rectangle.



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3. L and M are the mid-points of sides AB and DC respectively of parallelogram ABCD. Prove that segments DL and BM trisect diagonal AC.



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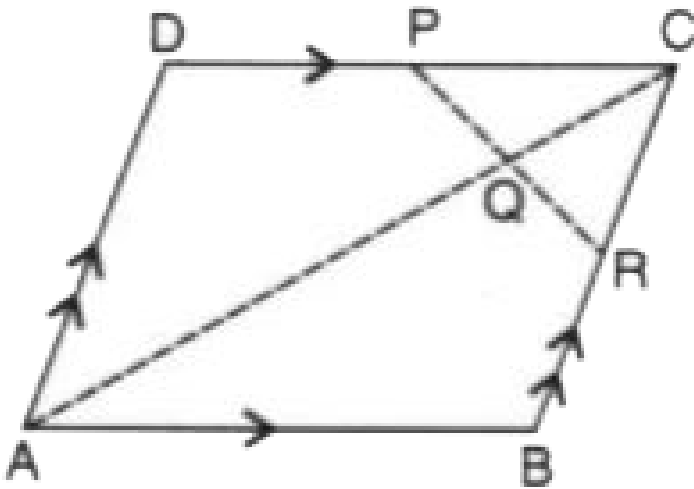
4. ABCD is a rectangle and P, Q, R and S are mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus.



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5. A parallelogram ABCD has P the mid-point of DC and Q a midpoint of AC such that $CQ = \frac{1}{4}AC$. PQ produced meets BC at R.

Prove that:



R is the mid-point of BC





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6. D and F are the mid-points of sides AB and AC of a triangle ABC. A line through F and parallel to AB meets BC at point E.

Prove that BDFE is a parallelogram



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7. D and F are the mid-points of sides AB and AC of a triangle ABC. A line through F and

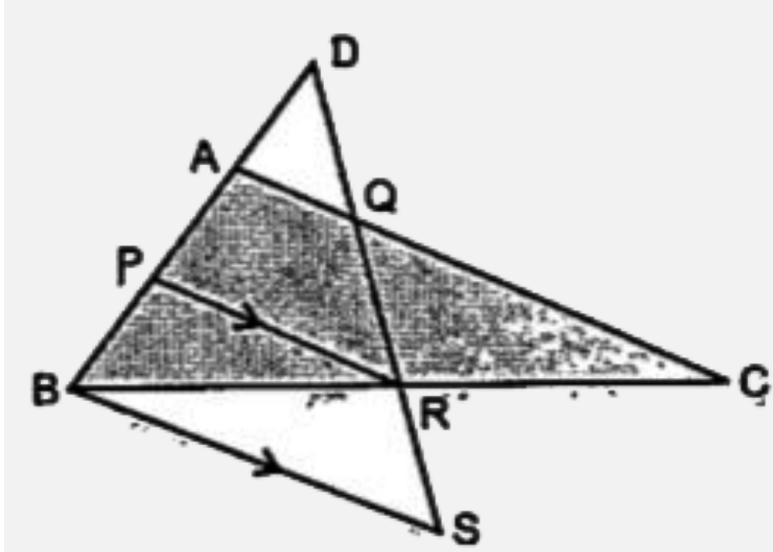
parallel to AB meets BC at point E .

Find AB , if $EF = 4.8\text{cm}$.



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8. In the figure, given below, $2AD = AB$, P is the mid-point of AB , Q is the mid-point of DR and $PR \parallel BS$. Prove that :

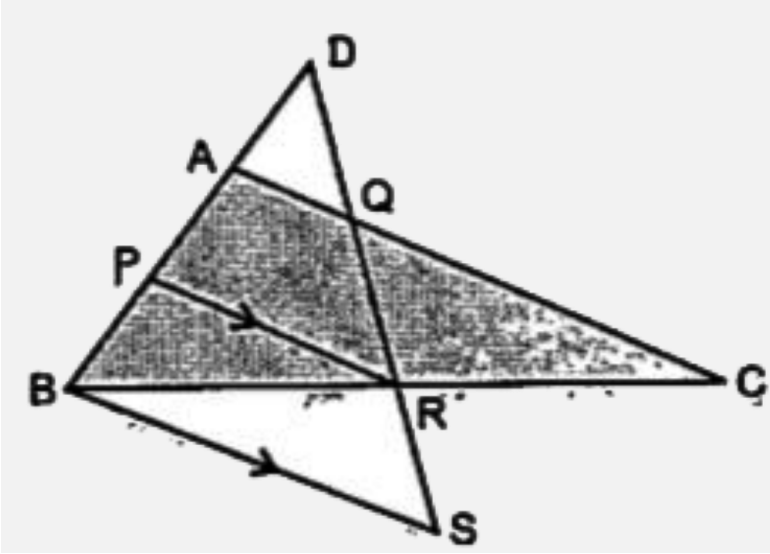


$$AQ \parallel BS$$



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9. In the figure, given below, $2AD = AB$, P is the mid-point of AB , Q is the mid-point of DR and $PR \parallel BS$. Prove that :



$$DS = 3RS$$

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10. In parallelogram ABCD, E and F are mid-points of the sides AB and CD respectively. The lines segments AF and BF meet the line

segments ED and EC at points G and H respectively. Prove that :
triangle HEB and FHC are congruent.



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11. In parallelogram $ABCD$, E and F are mid-points of the sides AB and CD respectively. The lines segments AF and BF meet the line segments ED and EC at points G and H respectively. Prove that :
 $GEHF$ is a parallelogram.



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12. In the given figure, ABCD is a parallelogram.

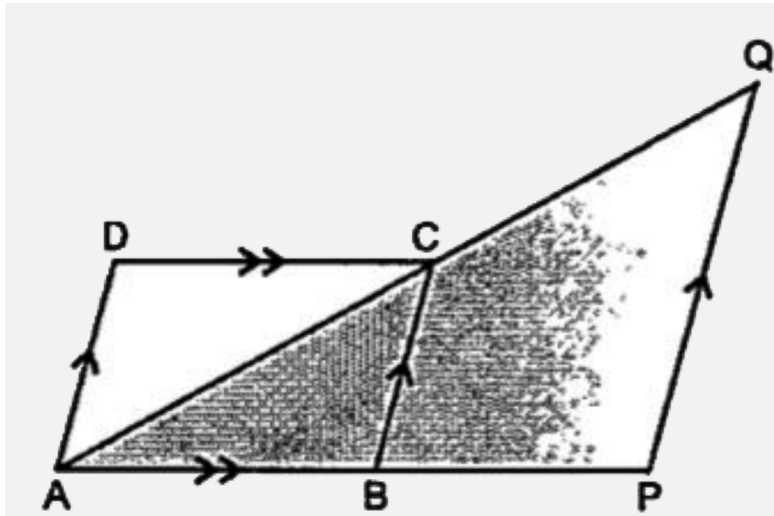
AB is produced to P, such that

$AB = BP$ and PQ is drawn parallel to BC to

meet AC produced at Q. Given

$AB = 8cm, AD = 5cm, AC = 10cm.$

Prove that point C is mid-point of AQ.



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13. In the given figure, ABCD is a parallelogram.

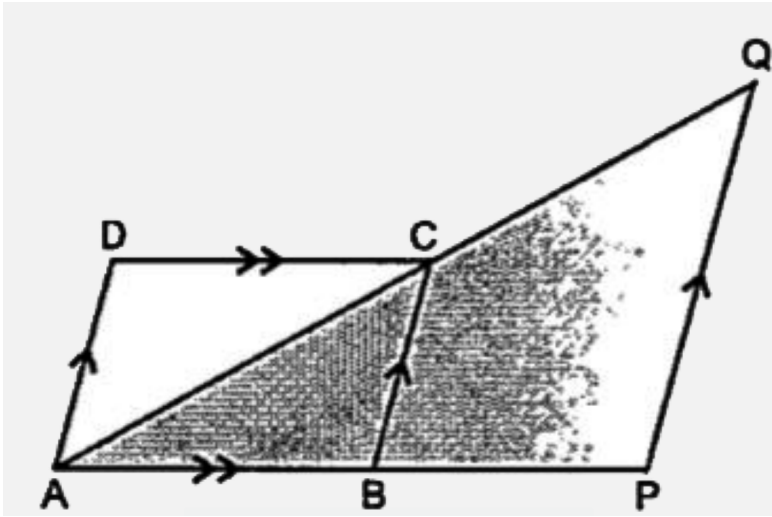
AB is produced to P, such that

$AB = BP$ and PQ is drawn parallel to BC to

meet AC produced at Q. Given

$AB = 8\text{cm}$, $AD = 5\text{cm}$, $AC = 10\text{cm}$.

Find the perimeter of quadrilateral BCQP.



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14. In the given figure ABCD is a trapezium, P is the mid-point of side AD and $PR \parallel AB \parallel DC$.

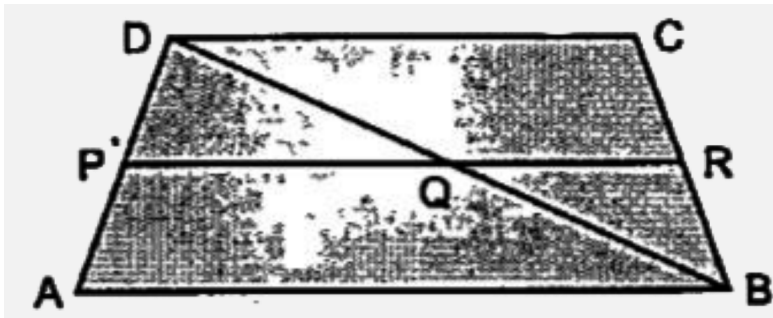


Prove that R is the mid-point of side BC



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15. In the given figure ABCD is a trapezium, P is the mid-point of side AD and $PR \parallel AB \parallel DC$.



Find the length of PR, if

$$AB = 12\text{cm} \text{ and } DC = 8\text{cm}$$



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