



MATHS

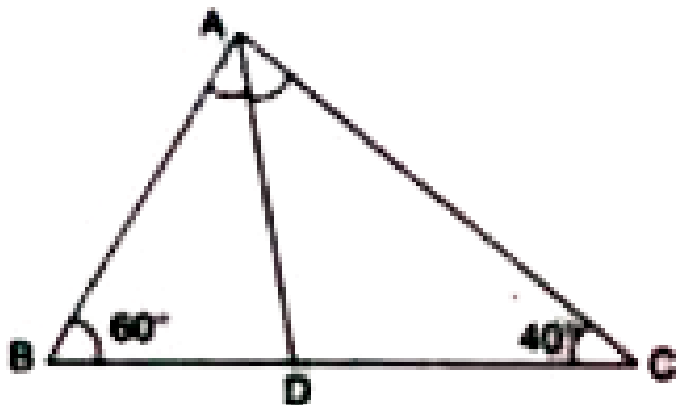
BOOKS - ICSE

INEQUALITIES

Example

1. In the adjoining figure, AD bisects $\angle A$.
Arrange AB, BD and DC in the descending

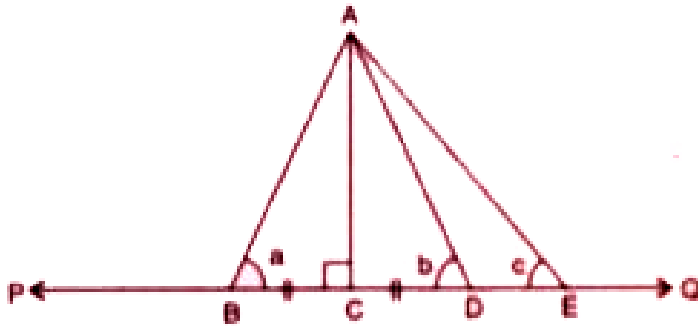
order of their lengths.



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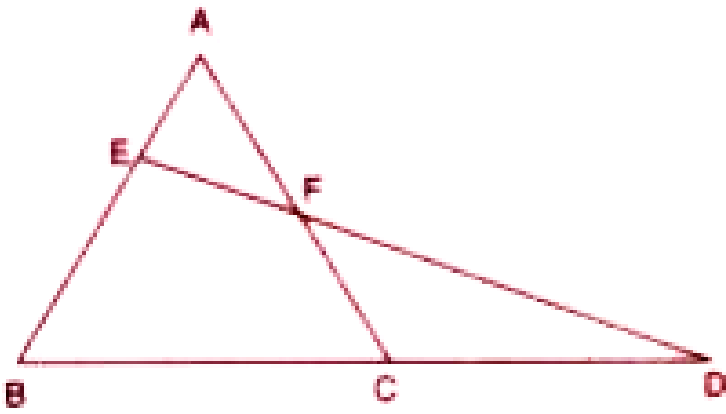
2. In the given figure, AC is perpendicular to line PQ and $BC = CD$. Show that AE is greater

than AB .



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3. In the given figure, $AB = AC$. Prove that AF is greater than AE .



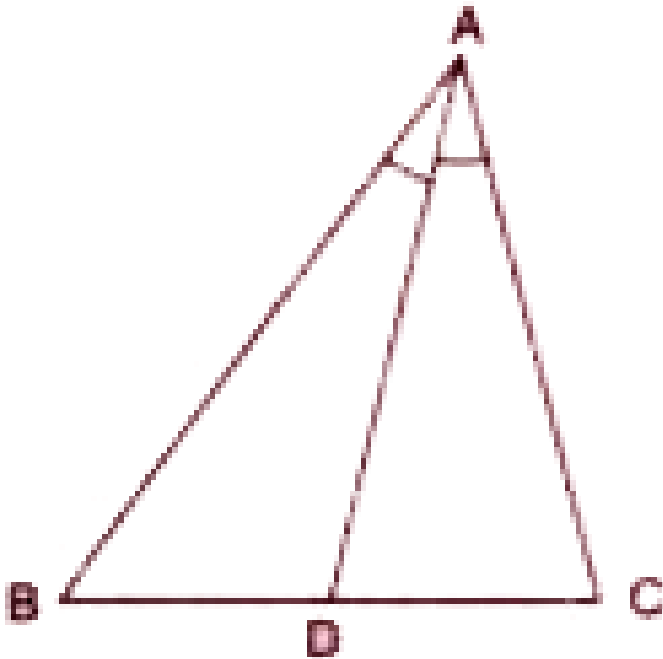
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4. In the figure, given alongside, AD bisects angle BAC. Prove that :

(i) $AB > BD$

(ii) $AC > CD$

(iii) $AB + AC > BC$

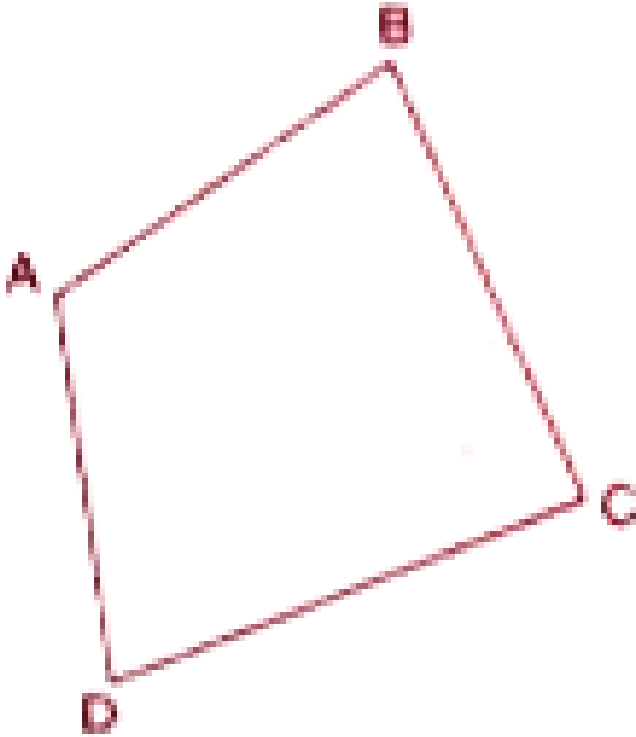


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5. In quadrilateral ABCD, AB is the shortest side and DC is the longest side. Prove that :

(i) $\angle B > \angle D$

(ii) $\angle A > \angle C$



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6. AD is a median of triangle ABC. Prove that :

$$AB + AC > 2AD$$



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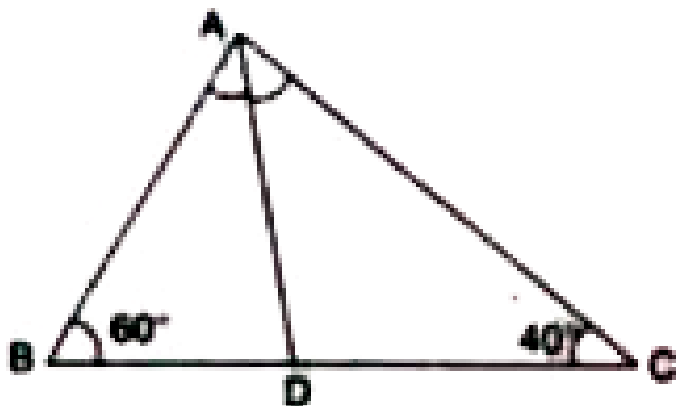
7. P is any point in the interior of a triangle ABC.

Prove that : $PA + PB < AC + BC$



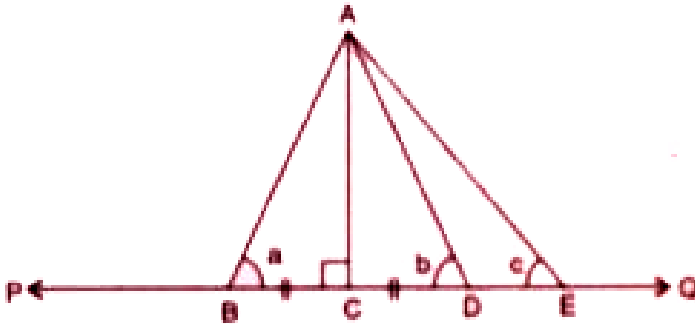
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8. In the adjoining figure, AD bisects $\angle A$. Arrange AB, BD and DC in the descending order of their lengths.



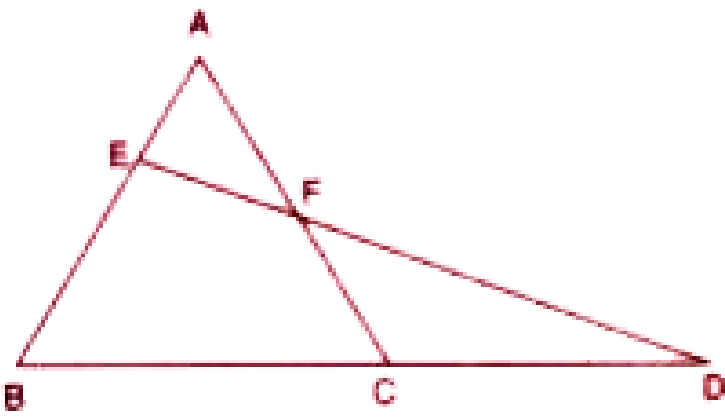
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9. In the given figure, AC is perpendicular to line PQ and $BC = CD$. Show that AE is greater than AB.



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10. In the given figure, $AB = AC$. Prove that AF is greater than AE.



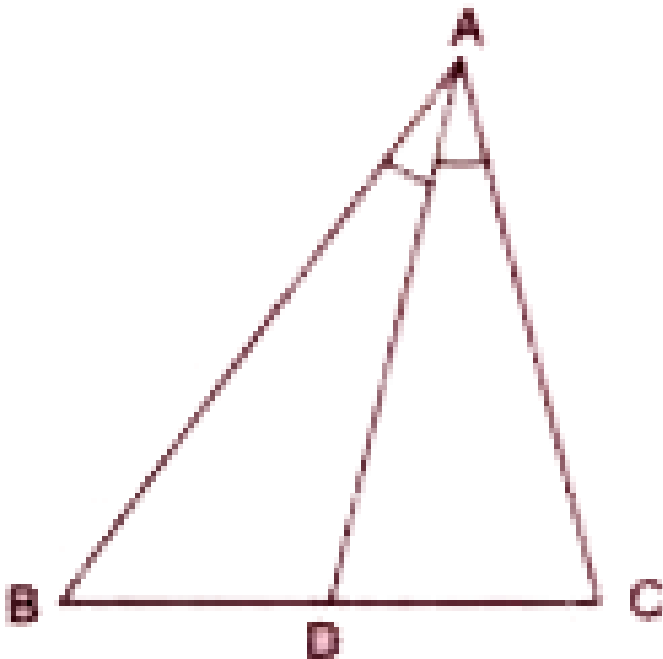
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11. In the figure, given alongside, AD bisects angle BAC. Prove that :

(i) $AB > BD$

(ii) $AC > CD$

(iii) $AB + AC > BC$

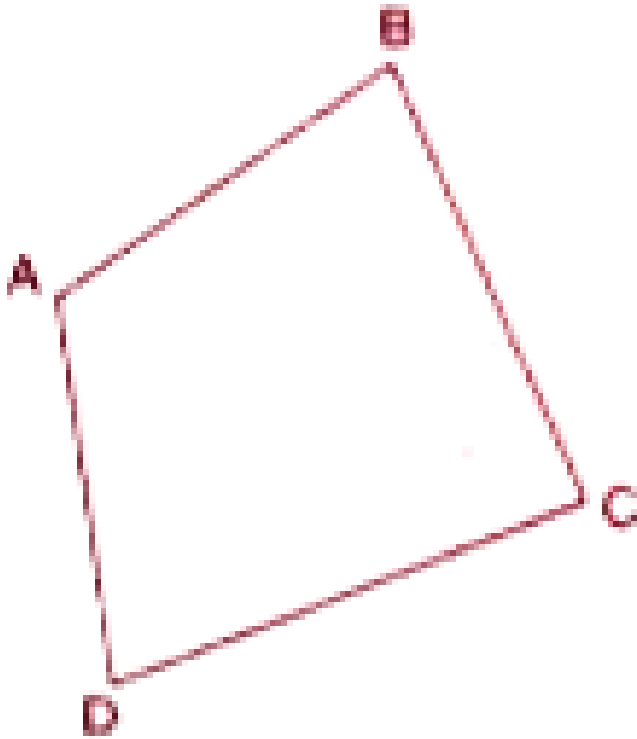


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12. In quadrilateral ABCD, AB is the shortest side and DC is the longest side. Prove that :

(i) $\angle B > \angle D$

(ii) $\angle A > \angle C$



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13. AD is a median of triangle ABC. Prove that :

$$AB + BC + AC > 2AD$$



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14. P is any point in the interior of a triangle ABC.

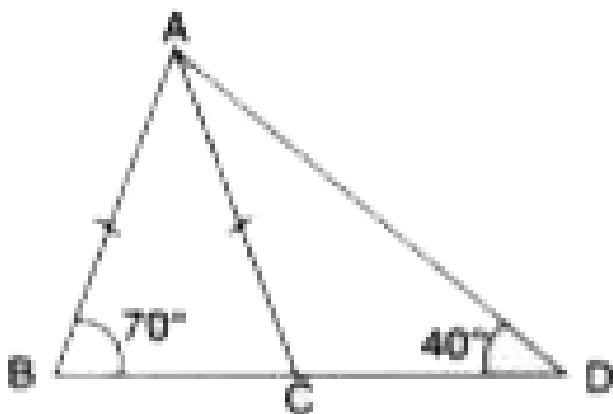
Prove that : $PA + PB < AC + BC$



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1. From the following figure, prove that :

$$AB > CD$$



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2. In a triangle PQR, $QR = PR$ and $\angle P = 36^\circ$.

Which is the largest side of the triangle ?



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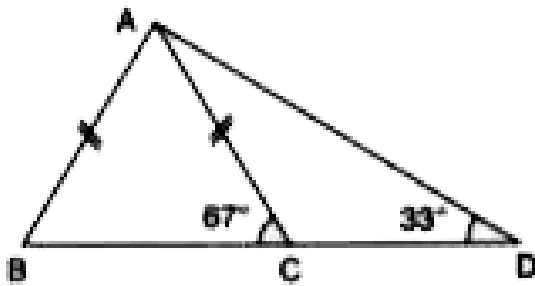
3. If two sides of a triangle are 8 cm and 13 cm, then the length of the third side is between a cm and b cm. Find the values of a and b such that a is less than b.



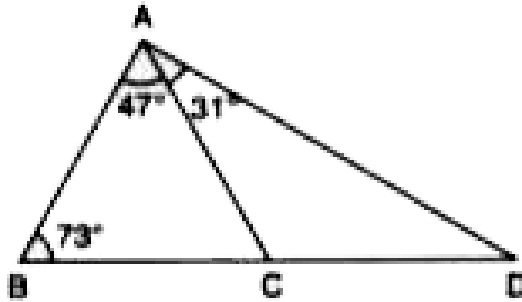
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4. In each of following figures, write BC, AC and CD in ascending order of their lengths.

(i)



(ii)



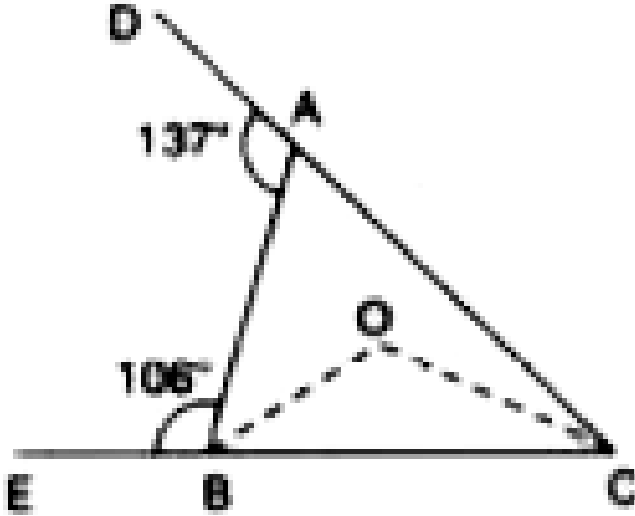
(i)



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5. Arrange the sides of $\triangle BOC$ in descending order of their lengths. BO and CO are

bisectors of angles ABC and ACB respectively.



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6. D is a point in side BC of triangle ABC . If $AD > AC$, show that $AB > AC$.

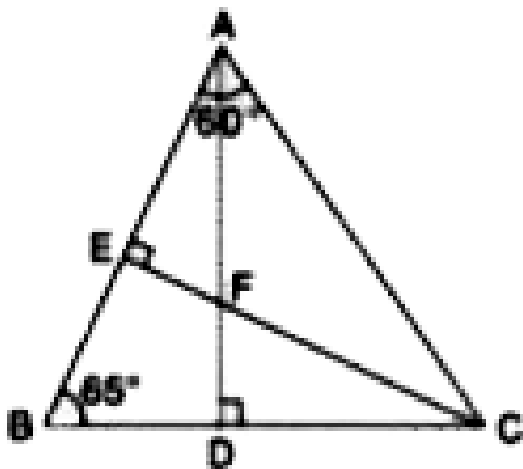
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7. In the following figure,

$$\angle BAC = 60^\circ \text{ and } \angle ABC = 65^\circ.$$

Prove that :

$$(i) CF > AF \quad (ii) DC > DF$$

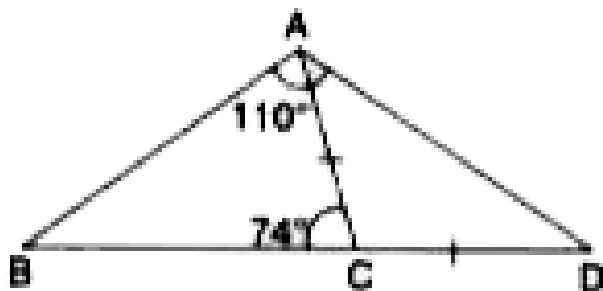


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8. In the following figure ,

$AC = CD$, $\angle BAD = 110^\circ$ and $\angle ACB = 74^\circ$.

Prove that : $BC > CD$.



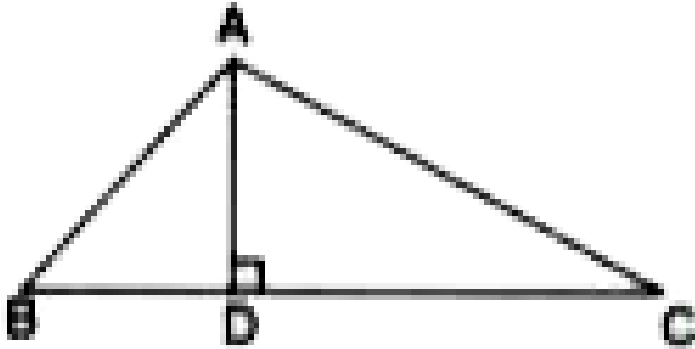
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9. From the following figure, prove that :

(i) $AB > BD$

(ii) $AC > CD$

(iii) $AB + AC > BC$



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10. In a quadrilateral ABCD, prove that :

(i) $AB + BC + CD > DA$

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

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

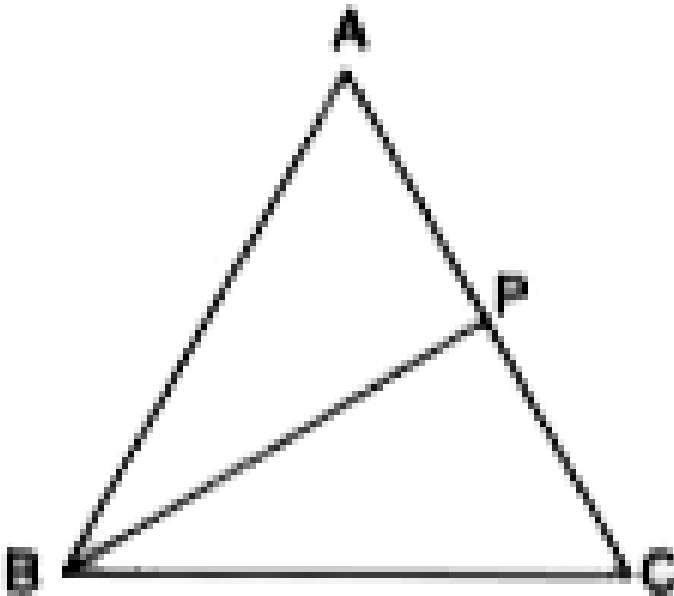


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11. In the following figure, ABC is an equilateral triangle and P is any point in AC, prove that :

$$(i) BP > PA$$

(ii) $BP > PC$



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12. P is any point inside the triangle ABC. Prove that : $\angle BPC > \angle BAC$.



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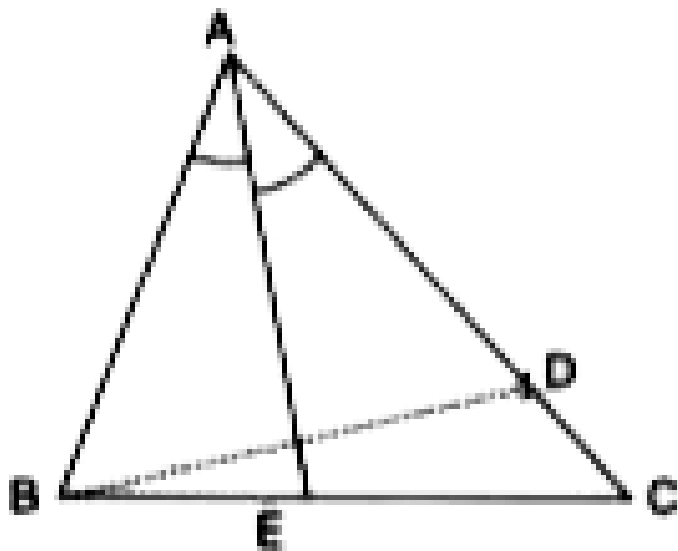
13. Prove that the straight line joining the vertex of an isosceles triangle to any point in the base is smaller than either of the equal sides of the triangle.



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14. In the following diagram, $AD = AB$ and AE bisects angle A . Prove that :

(i) $BE = DE$ (ii) $\angle ABD > \angle C$



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15. The sides AB and AC of a triangle ABC are produced, and the bisectors of the external

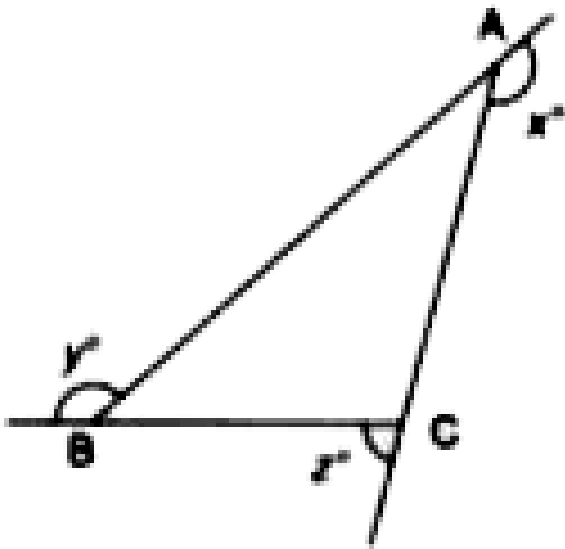
angles at B and C meet at P. Prove that if

$AB > AC$, then $PC > PB$.



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16. In the following figure, AB is the largest side and BC is the smallest side of the triangle ABC.



Write the angles x° , y° and z° in ascending order of their values.

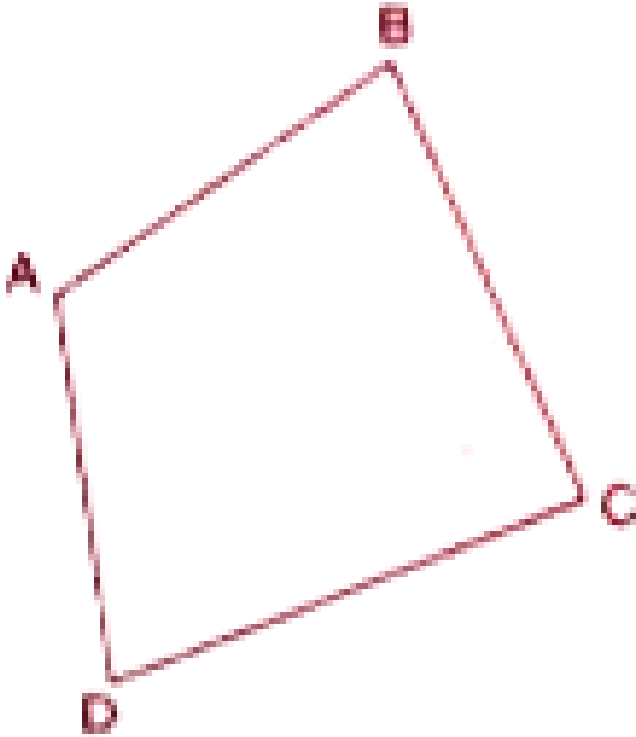


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17. In quadrilateral ABCD, AB is the shortest side and DC is the longest side. Prove that :

(i) $\angle B > \angle D$

(ii) $\angle A > \angle C$



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18. In triangle ABC , side AC is greater than side AB . If the internal bisector of angle A meets the opposite side at point D , prove that :
 $\angle ADC$ is greater than $\angle ADB$.



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19. In isosceles triangle ABC , sides AB and AC are equal. If point D lies in base BC and point E lies on BC produced (BC being produced through vertex C), prove that :

(i) $AC > AD$

(ii) $AE > AC$

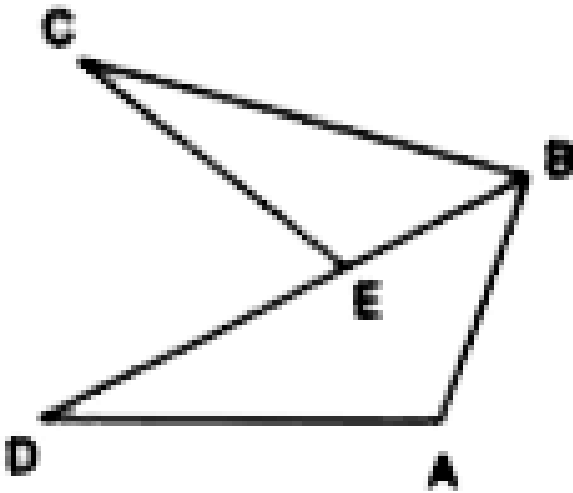
(iii) $AE > AD$



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20. Given : $ED = EC$

Prove : $AB + AD > BC$.



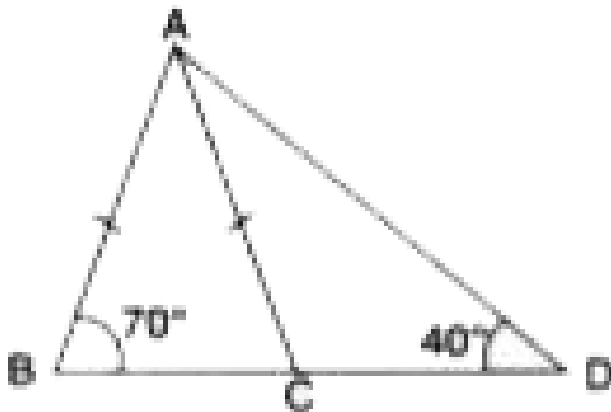
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21. In triangle ABC , $AB > AC$ and D is a point in side BC . Show that : $AB > AD$.

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22. From the following figure, prove that :

$$AB > CD$$



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23. In a triangle PQR, $QR = PR$ and $\angle P = 36^\circ$.

Which is the largest side of the triangle ?





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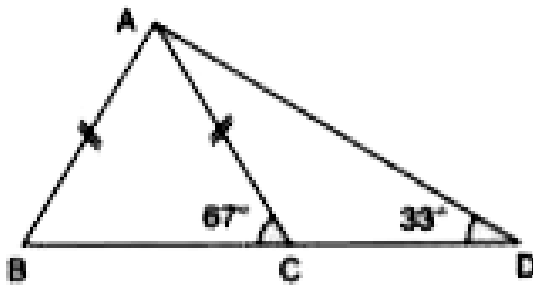
24. If two sides of a triangle are 8 cm and 13 cm, then the length of the third side is between a cm and b cm. Find the values of a and b such that a is less than b .



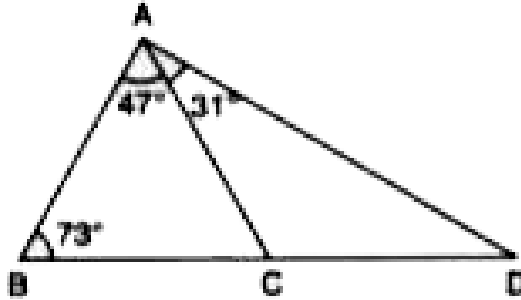
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25. In each of following figures, write BC , AC and CD in ascending order of their lengths.

(i)



(ii)



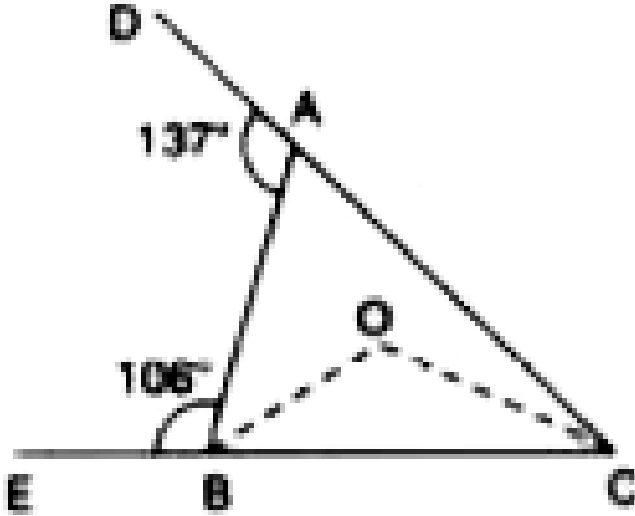
(i)



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26. Arrange the sides of $\triangle BOC$ in descending order of their lengths. BO and CO are

bisectors of angles ABC and ACB respectively.



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27. D is a point in side BC of triangle ABC . If $AD > AC$, show that $AB > AC$.

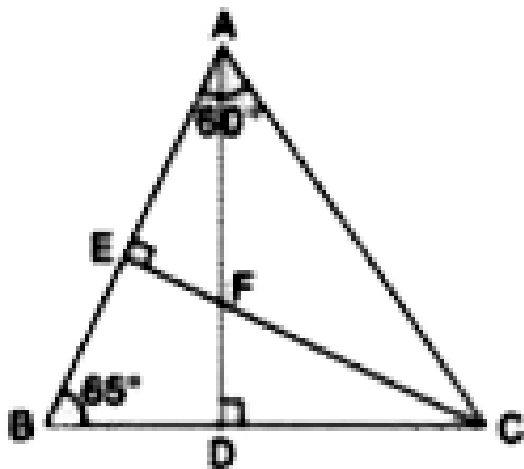
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28. In the following figure,

$$\angle BAC = 60^\circ \text{ and } \angle ABC = 65^\circ.$$

Prove that :

$$(i) CF > AF \quad (ii) DC > DF$$

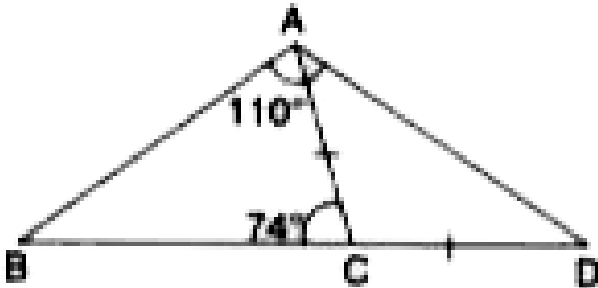


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29. In the following figure ,

$AC = CD$, $\angle BAD = 110^\circ$ and $\angle ACB = 74^\circ$.

Prove that : $BC > CD$.



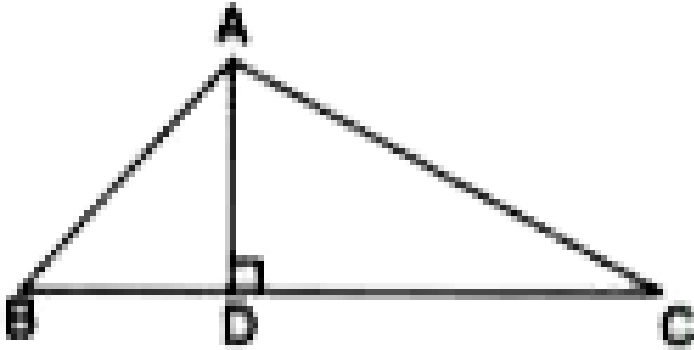
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30. From the following figure, prove that :

(i) $AB > BD$

(ii) $AC > CD$

(iii) $AB + AC > BC$



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31. In a quadrilateral ABCD, prove that :

(i) $AB + BC + CD > DA$

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

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

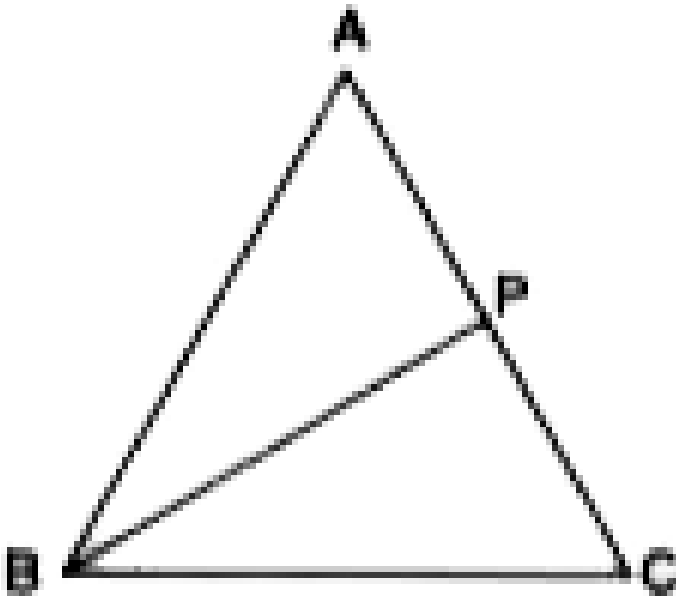


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32. In the following figure, ABC is an equilateral triangle and P is any point in AC, prove that :

$$(i) BP > PA$$

(ii) $BP > PC$



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33. P is any point inside the triangle ABC. Prove that : $\angle BPC > \angle BAC$.



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34. Prove that the straight line joining the vertex of an isosceles triangle to any point in the base is smaller than either of the equal sides of the triangle.



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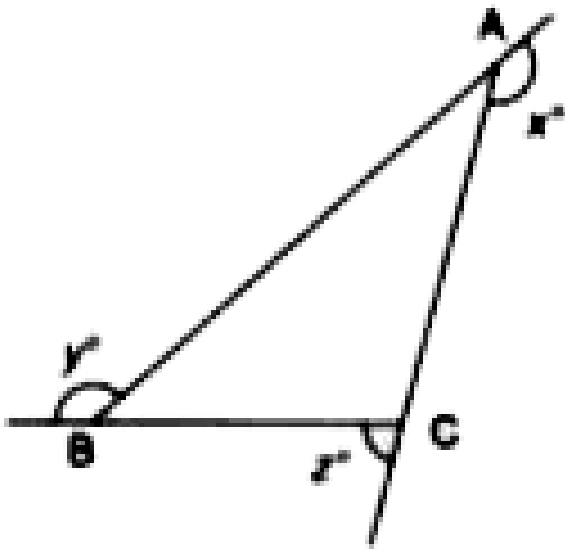
35. In the following diagram, $AD = AB$ and AE bisects angle A . Prove that :

angles at B and C meet at P. Prove that if $AB > AC$, then $PC > PB$.



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37. In the following figure, AB is the largest side and BC is the smallest side of the triangle ABC.



Write the angles x° , y° and z° in ascending order of their values.



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38. In quadrilateral ABCD, side AB is the longest and side DC is the shortest. Prove that

:

(i) $\angle C > \angle A$ (ii) $\angle D > \angle B$



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39. In triangle ABC, side AC is greater than side AB. If the internal bisector of angle A meets the opposite side at point D, prove that : $\angle ADC$ is greater than $\angle ADB$.



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40. In isosceles triangle ABC , sides AB and AC are equal. If point D lies in base BC and point E lies on BC produced (BC being produced through vertex C), prove that :

(i) $AC > AD$

(ii) $AE > AC$

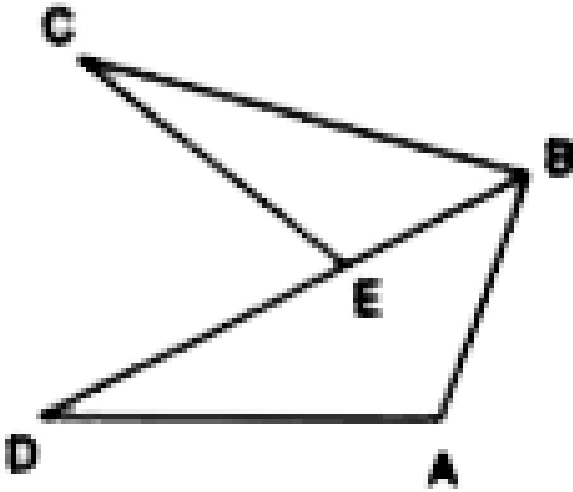
(iii) $AE > AD$



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41. Given : $ED = EC$

Prove : $AB + AD > BC$.



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42. In triangle ABC , $AB > AC$ and D is a point in side BC . Show that : $AB > AD$.



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