



MATHS

BOOKS - MAHAVEER PUBLICATION

PROPERTIES OF TRIANGLES

Question Bank

1. Prove that in any

$$\Delta ABC, a(\sin B - \sin C) + b(\sin C - \sin A) + c(\sin A - \sin B) = 0$$

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2. In any triangle ABC, prove that

$$a \sin (B - C) + b \sin (C - A) + c \sin (A - B) = 0$$



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3. In any Delta ABC, prove that $a \cos \frac{B - C}{2} = (b + c) \sin \frac{A}{2}$



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4. If $a = 2, b = 3$ and $c = 4$, find $\cos A, \cos B$ and $\cos C$.



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5. In any triangle ABC, the side are $a = 7, b = 5$ and $c = 8$. Find A.



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6. Find the greatest angle of the triangle whose sides measure 3 cm, 4 cm and 5 cm.



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7. In a triangle ABC , prove that

$$(a^2 + b^2 - c^2)\tan C - (b^2 + c^2 - a^2)\tan A = 0$$



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8. Prove that in triangle ABC “tan” $\frac{B - C}{2} = \frac{b - c}{b + c}$ ”cot” $\frac{A}{2}$



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9. In $\triangle ABC$, prove that

$$(b + c)\cos A + (c + a)\cos B + (a + b)\cos C = a + b + c.$$



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10. If $a=3, b=4$ and $c=5$, find $\cos A, \cos B$ and $\cos C$.

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11. The sides of a triangle are 8 cm, 10 cm and 12 cm, find the greatest angle.

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12. The sides of a triangle are 3 cm, 5 cm and 7 cm. Find the greatest angle of the triangle.

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13. A triangle side are few $7cm, 4\sqrt{3}cm$ and $\sqrt{13}cm$ then the smallest angle is



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14. In any triangle ABC, if $\angle C = 90^\circ$, AC=4 unit, BC=3, find AB.



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15. For any triangle ABC, prove that $\frac{a+b}{c} = \frac{\cos\left(\frac{A-B}{2}\right)}{\frac{\sin C}{2}}$



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16. For any triangle ABC, prove that $\frac{a-b}{c} = \frac{\sin\left(\frac{A-B}{2}\right)}{\frac{\cos C}{2}}$



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17. In any triangle ABC prove that:

$$\sin\left(\frac{B - C}{2}\right) = \left(\frac{b - c}{a}\right) \frac{\cos A}{2}$$

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18. For any triangle ABC , prove that $a(b \cos C - c \cos B) = b^2 - c^2$

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19. In ΔABC , prove that:

$$a(\cos C - \cos B) = 2(b - c) \frac{\cos^2 A}{2}$$

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20. In any triangle ABC prove that:

$$\sin\left(\frac{B - C}{2}\right) = \left(\frac{b - c}{a}\right) \frac{\cos A}{2}$$

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21. In any triangle ABC , prove that: $\frac{\sin(B - C)}{\sin(B + C)} = \frac{b^2 - c^2}{a^2}$

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22. In any triangle ABC prove that:

$$\sin\left(\frac{B - C}{2}\right) = \left(\frac{b - c}{a}\right) \frac{\cos A}{2}$$

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23. In any triangle ABC , prove that:

$$(b - c) \frac{\cot A}{2} + (c - a) \frac{\cot B}{2} + (a - b) \frac{\cot C}{2} = 0$$

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24. In any triangle ABC , prove that:

$$a^3 \sin(B - C) + b^3 \sin(C - A) + c^3 \sin(A - B) = 0$$

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25. For any triangle ABC , prove that

$$\frac{\cos A}{a} + \frac{\cos B}{b} + \frac{\cos C}{c} = \frac{a^2 + b^2 + c^2}{2abc}$$

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26. In any $\triangle ABC$, prove that

$$\frac{(b^2 - c^2)}{a^2} \sin 2a + \frac{(c^2 - a^2)}{b^2} \sin 2B + \frac{(a^2 - b^2)}{c^2} \sin 2C = 0$$

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27. For any triangle ABC , prove that

$$(b^2 - c^2) \cot A + (c^2 - a^2) \cot B + (a^2 - b^2) \cot C = 0$$

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28. In any triangle ABC , prove that:

$$\frac{a^2 \sin(B - C)}{\sin B + \sin C} + \frac{b^2 \sin(C - A)}{\sin C + \sin A} + \frac{c^2 \sin(A - B)}{\sin A + \sin B} = 0$$

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