MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

CONDITIONAL IDENTITIES INVOLVING THE ANGLES OF A TRIANGLE

Solved Examples

1. If $A+B+C=\pi,$ prove that

$\sin 2A+\sin 2B+\sin 2C=4\sin A\sin B\sin C.$

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2. If $A+B+C=\pi,$ prove that

$\sin 2A-\sin 2B+\sin 2C=4\cos A\sin B\cos C.$

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3. If $A+B+C=\pi$, prove that

$\cos 2A+\cos 2B+\cos 2C=-1-4\cos A\cos B\cos C.$

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4. If $A+B+C=\pi$, prove that :

$\cos 2A+\cos 2B-\cos 2C=1-4\sin A\sin B\cos C$

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5. If $A+B+C+\pi$, prove that

$\cos 4A+\cos 4B+\cos 4C=-1+4\cos 2A\cos 2B\cos 2C.$

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6. $\sin A + \sin B - \sin C = 4\sin\left(\frac{A}{2}\right)\sin\left(\frac{B}{2}\right)\cos\left(\frac{C}{2}\right)$

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7. If $A + B + C = \pi$, prove that : `cosA + cosB-cosC=4cos, A/2 cos, B/2 sin, C/2 -1

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8. If $A + B + C = \pi$, prove that $\sin^2 A + \sin^2 B + \sin^2 C = 2(1 + \cos A \cos B \cos C)$

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9. If $A + B + C = 180^0$, prove that : $\cos^2 A + \cos^2 B - \cos^2 C = 1 - 2\sin A \sin B \cos C$

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10. Prove that: $\cos^2 A + \cos^2\left(A + \frac{2\pi}{3}\right) + \cos^2\left(A - \frac{2\pi}{3}\right) = \frac{3}{2}$

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11. If $A + B + C = \pi$, prove that $\frac{\sin^2 A}{2} + \frac{\sin^2 B}{2} - \frac{\sin^2 C}{2} = 1 - 2\frac{\cos A}{2}\frac{\cos B}{2}\frac{\sin C}{2}$.

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12. If $A + B + C = \pi$ then prove that $\cos^2\left(\frac{A}{2}\right) + \cos^2\left(\frac{B}{2}\right) - \cos^2\left(\frac{C}{2}\right) = 2\cos\left(\frac{A}{2}\right)\cos\left(\frac{B}{2}\right)\sin\left(\frac{C}{2}\right)$

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13. If $A + B + C = 180^0$, prove that : $\cos^2, \frac{A}{2} + \cos^2, \frac{B}{2} - \cos^2, \frac{C}{2} = 2 + 2\sin, \frac{A}{2}\sin, \frac{A}{2}, \sin, \frac{B}{2}, \sin, \frac{C}{2}$

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14. If $\tan A + \tan B + \tan C = \tan A \tan B \tan C$ then

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15. If $A + B + C = \pi$, prove that :

$$\frac{\tan A}{2}\frac{\tan B}{2} + \frac{\tan B}{2}\frac{\tan C}{2} + \frac{\tan C}{2}\frac{\tan A}{2} = 1$$

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16. cotBcotC+cotCcotA+cotAcotB=1

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17. If $A + B + C = \pi$, prove that :

$$\cot, \frac{A}{2} + \cot, \frac{B}{2} + \cot, \frac{C}{2} = \cot, \frac{A}{2}\cot, \frac{B}{2}\cot, \frac{C}{2}$$

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Exercise 16

1. If $A+B+C=180^0$, prove that $\sin 2A+\sin 2B-\sin 2C=4\cos A\cos B\sin C$

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2. If $A+B+C=\pi$, prove that

$\cos 2A-\cos 2B-\cos 2C=-1+4\cos A\sin B\sin C$

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3. If $A+B+C=\pi$, prove that :

$\cos 2A+\cos 2B-\cos 2C=1-4\sin A\sin B\cos C$

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4. If $A+B+C=\pi$, prove that :

$$\sin A+\sin B+\sin C=4\cos,\frac{A}{2}\cos,\frac{B}{2}\cos,\frac{C}{2}$$

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5. If $A+B+C=\pi$ then prove that

$$\cos A+\cos B+\cos C=1+4\sin\left(\frac{A}{2}\right).\sin\left(\frac{B}{2}\right).\sin\left(\frac{C}{2}\right)$$

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6. $$\frac{\sin 2A+\sin 2B+\sin 2C}{\sin A+\sin B+\sin C}=8\sin\left(\frac{A}{2}\right)\sin\left(\frac{B}{2}\right)\sin\left(\frac{C}{2}\right)$$

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7. If $A+B+C=\pi$, prove that :

$$\sin(B+C-A)+\sin(C+A-B)+\sin(A+B-C)=4\sin A\sin B\sin$$

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8. If $A+B+C=\pi$, prove that :

$$\frac{\cos A}{\sin b \sin C}+\frac{\cos B}{\sin C \sin}+\frac{\cos C}{\sin A \sin B}=2.$$

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9. If $A+B+C=180$, prove that

$\cos^2 A+\cos^2 B+\cos^2 C=1-2\cos A\cos B\cos C$.

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10. If $A+B+C=\pi$, prove that

$\sin^2 A-\sin^2 B+\sin^2 C=2\sin A\cos B\sin C$

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11. If $A+B+C=180^0{}'$, $Provet\widehat{:}$ sin^2 (A/2 + sin^2 B/2 + sin^2 C/2 =1-2 sin A/2 sin B/2 sin C/2`

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12. If $A+B+C=\frac{\pi}{2}$ then $\tan 2A+\tan 2B+\tan 2C=$

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