(1)

SOLUTION OF TRIANGLE

For any triangle ABC, prove that

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

(2) find $\angle B$, if $a=2$ $b=3$ and $\sin A = \frac{2}{3}$.

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

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

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

6) $a\cos A + b\cos B + c\cos C = 2b\sin A\sin C$.

7) find 'b' if $\angle B = 45^\circ$, $\angle C = 105^\circ$ and $a=2$.

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

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

10) $\tan\left(\frac{A-B}{2}\right) = \frac{a-b}{a+b}\cdot\cot\left(\frac{C}{2}\right)$

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

12) $2\left(b\cos^2\frac{C}{2} + c\cos^2\frac{B}{2}\right) = a+b+c$

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

14) $(a+b+c)(a-b+c) = 3ca$ if $\angle B = 60^\circ$

15) $\triangle ABC$ is isosceles if $\frac{\cos A}{a} = \frac{\cos B}{b}$.