Name: _____ Points: _____

1. Prove the identity: $1+\cos A=\dfrac{\sin^2 A}{1-\cos A}$

2. Prove the identity: $\tan B+\cot B=\sec B\csc B$

3. Prove the identity: $\sin x\cot^2 x+\sin x=\csc x$

4. Prove the identity: $\sin^2 a=\dfrac{1-\cos^4 a}{1+\cos^2 a}$

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5. Prove the identity: $\dfrac{1+\tan y}{1+\cot y} = \tan y$

6. Prove the identity: $\dfrac{1}{\cos B} - \cos B = \sin B \tan B$

7. Prove the identity: $2\csc^2 t = \dfrac{1}{1-\cos t} + \dfrac{1}{1+\cos t}$

During the years of 162-127 BC lived Hipparchus in the town of Nicaea, near present day Istanbul. Theon, a Greek scholar and mathematician who lived in Alexandria, Egypt, dubbed Hipparchus "The Father of Trigonometry" (Cajori, 1985). This honorific name was given to Hipparchus because he undertook the task of calculating and tabulating corresponding values of arc and chord for a whole series of angles (Boye, 1968). Hipparchus evidently drew up the tables for his research in astronomy; mathematics was a means to study the angles and movement of the stars and planets, his real interest.

References:

Boye, C.B. (1968). *A history of mathematics (2nd Ed.).* New York, NY: John Wiley and Sons
Cajori, F. (1985). *A history of mathematics.* New York, NY: Chelsea Publishing Company.

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