Pre-Calculus Name: Date: Period:

Unit 9 Review

Complete the problems below, show your work, and write your answer in the blank provided.

<u>Target 9A:</u> I can use and apply fundamental trigonometric identities

1. Simplify $\sec(-1)\cos(-1)$ to either 1 or -1

2. Prove: $\frac{1}{\sin^2 x} + \frac{\sec^2 x}{\tan^2 x} = 2\csc^2 x.$

3. Simplify the expression $\tan x \cdot \cos x$ to a single trigonometric function. Show your steps.

4. Find all the solutions to the equation in the interval $[0,2\pi)$ for the equation

$$2\cos x \sin x - \cos x = 0$$

***Target 9B*: I can prove trigonometric identities**

5. Prove: $(\cos x)(\tan x + \sin x \cot x) = \sin x + \cos^2 x$

6. Prove: $\frac{\cos^2 x - 1}{\cos x} = -\tan x \cdot \sin x$

7. Prove: $\sec x - \cos x = \sin x \cdot \tan x$

8. Prove: $\sin 4x = (4 \sin x \cos x)(2\cos^2 x - 1)$

<u>Target 9C</u>: I can use and apply sum and difference identities

9. Prove: $\sin\left(x - \frac{\pi}{2}\right) = -\cos x$

10. Evaluate $\cos 75°$ exactly.

11. Write $\sin 37° \cdot \cos 14° + \sin 14° \cdot \cos 37°$ as a single sine or cosine expression.

12. Prove: $\sin(x - y) + \sin(x + y) = 2 \sin x \cdot \cos y$

<u>Target 9D</u> I can use and apply multiple angle identities

13. Prove: $\cos 2x = 1 - 2\sin^2 x$

14. Find all solutions to the equation in the interval $[0,2\pi)$.

$$\sin 2x = \sin x$$

15. Use a half-angle identity to evaluate $\sin\left(\frac{5\pi}{12}\right)$ exactly.

Study Note:
Can you show that $\cos(u + v) = \cos u \cos v - \sin u \sin v$ leads to a double-angle formula for $\cos(2u)$, then a power reducing formula for $\sin^2 u$, then a half angle formula for $\sin\left(\frac{u}{2}\right)$?