| Student: _____ | **Instructor:** Joe Betters | |
| Date: _____ | **Course:** Pre-Calculus Pre AP (Master Course) | **Assignment:** 7.4 Classwork (Day 2) |

1. Establish the identity.

$$\frac{\csc\theta + \sin\theta}{\csc\theta - \sin\theta} = \frac{1 + \sin^2\theta}{\cos^2\theta}$$

Write the left side in terms of sine and cosine.

$$\frac{\underline{\hspace{2cm}} + \sin\theta}{\underline{\hspace{2cm}} - \sin\theta}$$

Write the expressions in the numerator and denominator from the previous step as single quotients with the common denominator.

$$\frac{\dfrac{\underline{\hspace{1.5cm}}}{\sin\theta}}{\dfrac{\underline{\hspace{1.5cm}}}{\sin\theta}}$$

Simplify the fraction from the previous step by canceling the common factors. Do not apply any trigonometric identity.

$$\frac{\underline{\hspace{1.5cm}}}{\underline{\hspace{1.5cm}}}$$

The fraction from the previous step then simplifies to $\dfrac{1 + \sin^2\theta}{\cos^2\theta}$ using what?

- ○ **A.** Reciprocal Identity
- ○ **B.** Quotient Identity
- ○ **C.** Cancellation Property
- ○ **D.** Even-Odd Identity
- ○ **E.** Pythagorean Identity

2. Establish the identity.

$$\frac{\sin\theta - \cos\theta}{\cos\theta} + \frac{\sin\theta + \cos\theta}{\sin\theta} = \csc\theta\sec\theta$$

Add the fractions on the left side. Apply the appropriate Pythagorean identity to simplify the numerator.

$$\frac{\underline{\hspace{2cm}}}{\sin\theta\cos\theta} \quad \text{(Simplify your answer.)}$$

The fraction from the previous step then simplifies to **csc θ sec θ** using what?

- ○ **A.** Pythagorean Identity
- ○ **B.** Even-Odd Identity
- ○ **C.** Cancellation Property
- ○ **D.** Reciprocal Identity
- ○ **E.** Quotient Identity

3. Show that the functions f and g are identically equal.

$$f(x) = \sin x \cdot \frac{1}{\cot x} \quad g(x) = \sec x - \cos x$$

Rewrite the expression for f(x) by applying a quotient identity and simplifying. Do not apply any trigonometric identity.

$$\sin x \cdot \frac{1}{\cot x} = \underline{\hspace{3cm}} \quad \text{(Simplify your answer.)}$$

Rewrite the expression from the previous step, applying a Pythagorean Identity to the numerator.

$$\underline{\hspace{3cm}}$$

The fraction from the previous step may be rewritten as **sec x − cos x** using what? Select all that apply.

- ☐ **A.** Cancellation Property
- ☐ **B.** Even-Odd Identity
- ☐ **C.** Pythagorean Identity
- ☐ **D.** Reciprocal Identity
- ☐ **E.** Quotient Identity

1. $\dfrac{1}{\sin \theta}$

$\dfrac{1}{\sin \theta}$

$1 + \sin^2 \theta$

$1 - \sin^2 \theta$

$1 + \sin^2 \theta$

$1 - \sin^2 \theta$

E. Pythagorean Identity

2. 1

D. Reciprocal Identity

3. $\dfrac{\sin^2 x}{\cos x}$

$\dfrac{1 - \cos^2 x}{\cos x}$

A. Cancellation Property, D. Reciprocal Identity

7.4 classwork day 2

① $\dfrac{\csc\theta + \sin\theta}{\csc\theta - \sin\theta} = \dfrac{1 + \sin^2\theta}{\cos^2\theta}$

$$\dfrac{\boxed{\dfrac{1}{\sin\theta}} + \sin\theta}{\boxed{\dfrac{1}{\sin\theta}} - \sin\theta} =$$

$$\dfrac{\boxed{1 + \sin^2\theta}}{\sin\theta} \Bigg/ \dfrac{\boxed{1 - \sin^2\theta}}{\sin\theta} =$$

$$\boxed{\dfrac{1 + \sin^2\theta}{1 - \sin^2\theta}} =$$

$$\dfrac{1 + \sin^2\theta}{\cos^2\theta}$$

$\boxed{\varepsilon}$ pythagorean identity

7.4 classwork day 2 continued

② $\dfrac{\sin\theta - \cos\theta}{\cos\theta} + \dfrac{\sin\theta + \cos\theta}{\sin\theta} = \csc\theta\sec\theta$

$\dfrac{\sin\theta(\sin\theta - \cos\theta) + \cos\theta(\sin\theta + \cos\theta)}{\sin\theta\cos\theta} =$

$\dfrac{\sin^2\theta - \sin\theta\cos\theta + \sin\theta\cos\theta + \cos^2\theta}{\sin\theta\cos\theta} =$

$\dfrac{\sin^2\theta + \cos^2\theta}{\sin\theta\cos\theta} =$

$\dfrac{\boxed{1}}{\sin\theta\cos\theta} =$

$\csc\theta\sec\theta$

$\boxed{D}$ Reciprocal Identity

7.4 classwork day 2 continued

③ $f(x) = \sin x \cdot \dfrac{1}{\cot x}$ $g(x) = \sec x - \cos x$

$$\sin x \cdot \dfrac{1}{\cot x} = \sin x \cdot \dfrac{\sin x}{\cos x}$$

$$= \boxed{\dfrac{\sin^2 x}{\cos x}}$$

$$= \boxed{\dfrac{1 - \cos^2 x}{\cos x}}$$

$$= \dfrac{1}{\cos x} - \dfrac{\cos^2 x}{\cos x}$$

$$= \sec x - \cos x$$

$\boxed{A, D}$ cancellation property and Reciprocal Identity