

Name _____

Trigonometry 2 Assignment #3

1. Verify the following identities for the given value of the variable:

a) $\cot x = \frac{\cos x}{\sin x}$ for $x = \frac{\pi}{3}$

b) $\sin^2 x + \cos^2 x = 1$ for $x = \frac{\pi}{4}$

2. Verify the identity $1 + \cot^2 x = \csc^2 x$ for the given values:

a) $x = \frac{\pi}{6}$

b) $x = \frac{4\pi}{3}$

3. Factor to write each in a simpler form.

a) $\sec x \sin^2 x - \sec x$

b) $\sin^4 \theta - \cos^4 \theta$

In each of the following :

- i) verify the possibility of an identity using a graphing calculator
- ii) prove the identity using an algebraic approach
- iii) state any restrictions.

a) $\frac{\tan \theta \cos \theta}{\sin \theta} = 1$

b) $\sec^2 x - \sin^2 x = \cos^2 x + \tan^2 x$

5.

Prove the following identities using an algebraic approach:

a) $(1 - \cos^2 x)(\csc x) = \sin x$

b) $(\sin x + \cos x)^2 = 1 + 2 \sin x \cos x$

c) $\frac{1 - \cos x}{\sin x} = \frac{\tan x - \sin x}{\tan x \sin x}$

d) $\frac{2}{1 - \sin x} + \frac{2}{1 + \sin x} = 4 \sec^2 x$

e) $\frac{1 + \cos x}{\tan x + \sin x} = \cot x$

f) $\sec x - \cos x = \frac{\sin x}{\cot x}$

In questions #7 - #11 assume the appropriate restrictions.

7. $\frac{\cos x}{1 - \sin^2 x}$ is equal to

- A. $\sec x$
- B. $\csc x$
- C. $\sin x$
- D. $\tan x$

8. $\frac{\tan^2 x + 1}{\sec x}$ is equal to

- A. $\sec x$
- B. $\csc x$
- C. $\sin x$
- D. $\tan x$

9. $\frac{\csc x}{\cot x}$ is equal to

- A. $\cos x$
- B. $\sin x$
- C. $\sec x$
- D. $\tan x$

10. The expression $\frac{\tan A \cos^2 A}{\sec A}$, expressed in terms of $\sin A$ is

- A. $\frac{\sin A}{1 - \sin^2 A}$
- B. $\frac{1 - \sin^2 A}{\sin A}$
- C. $\sin^2 A$
- D. $\sin A - \sin^3 A$

11. $\sec x - \cos x$ is equal to

- A. $\frac{1 - \cos x}{\cos x}$
- B. $\sin^2 x$
- C. $\frac{1 - 2\cos x}{\cos x}$
- D. $\sin x \tan x$

12. Which of the following is NOT an identity?

- A. $\cos^2 x + \sin^2 x = 1$
- B. $\sin x + \cos x = 1$
- C. $\sec^2 x - \tan^2 x = 1$
- D. $\tan x \cot x = 1$

13. If $\tan x \neq 0$, $\cos x \neq 0$, $\cot x \neq 0$ then

$$\frac{1}{\tan x \cos x \cot x} \text{ is equal to}$$

A. $\frac{1}{\sin x}$

B. $\sin x$

C. $\frac{1}{\cos x}$

D. $\cos x$

14. If $\sin x \neq 0$, $\cos x \neq 0$ then

$$\frac{\tan x \cos x}{3 \sec x \cot x} \text{ is equal to}$$

A. $\frac{1}{3}$

B. 3

C. $\frac{1}{3} \sin^2 x$

D. $\frac{1}{3} \csc^2 x$

15. When verifying the identity $\cot^2 x + 1 = \csc^2 x$ for $x = \frac{\pi}{7}$, the value on each side of the identity, to the nearest tenth, is _____.
(Record your answer in the numerical response box from left to right)

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