

Practice TEST: 4.7-5.1—Calculator Permitted

Part I: Multiple Choice_____ 1. The principal value range for the function $f(x) = \arcsin x$ is

- (A)
- $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
- (B)
- $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$
- (C)
- $[0, \pi]$
- (D)
- \mathbb{R}
- (E)
- $[-1, 1]$

_____ 2. Evaluate: $\text{Arcsin}\left(\sin \frac{5\pi}{8}\right)$

- (A)
- $\frac{5\pi}{8}$
- (B)
- $\frac{\pi}{8}$
- (C)
- $\frac{3\pi}{8}$
- (D)
- $-\frac{\pi}{8}$
- (E)
- $-\frac{3\pi}{8}$

_____ 3. Evaluate the following on the calculator: $\text{arc sec } 0.5$

- (A) 0.524 (B) 2.086 (C) 1.047 (D) 1.139 (E) undefined

_____ 4. Evaluate: $T \text{an}^{-1}(-2.6)$

- (A) undefined (B) -0.831 (C) -0.367 (D) 1.662 (E) -1.204

_____ 5. $\sin(\text{arc sec } 2x) =$

- (A)
- $\frac{\sqrt{2x^2-1}}{2x}$
- (B)
- $\frac{\sqrt{4x^2-1}}{2x}$
- (C)
- $\frac{\sqrt{1-2x^2}}{2x}$
- (D)
- $\frac{\sqrt{1-4x^2}}{2x}$
- (E)
- $2x$

_____ 6. The period of the function $f(x) = 2 - 4 \tan 3x$ is what?

- (A) 2 (B) 3 (C) 4 (D)
- $\frac{2\pi}{3}$
- (E)
- $\frac{\pi}{3}$

_____ 7. Given that $\cos\left(\theta - \frac{\pi}{2}\right) = -\frac{4}{5}$, find $\sin(-\theta)$

- (A)
- $\frac{4}{5}$
- (B)
- $-\frac{4}{5}$
- (C)
- $\frac{3}{5}$
- (D)
- $-\frac{3}{5}$
- (E)
- $\frac{\pi}{2}$

_____ 8. Simplify: $\frac{\csc \theta \cot \theta}{\sec \theta} =$

- (A) 1 (B)
- $\cot^2 \theta$
- (C)
- $\csc^2 \theta$
- (D)
- $\sec^2 \theta$
- (E)
- $\tan^2 \theta$

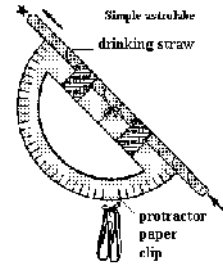
_____ 9. Simplify: $\frac{4}{\sin^2 x} + 4 \cot(-x) - 4 + \cos x \sec x =$

- (A)
- $(4 \tan x + 1)(\tan x + 1)$
- (B)
- $(2 \cot x - 1)^2$
- (C)
- $(2 \tan x - 1)(2 \tan x + 1)$
- (D)
- $2 \cot^2 x$
- (E) 1

Part II: Free Response

SHOW ALL SETUPS AND EXPRESSIONS PLUGGED INTO YOUR CALCULATOR. YOU CAN GET POINTS FOR THESE EVEN IF YOUR ANSWERS ARE INCORRECT!!!! Be sure to put a “bubble” on your degrees throughout, and include other units on final answers.

2. Suppose you and your two friends, Friend *A* and Friend *B* are conducting an experiment. You stand atop the band tower and throw your precal book straight up high into the air. Your two friends are on the ground 12 feet apart on the same side of the tower. They simultaneously take angles of elevation with their homemade sextants (like the one at right.) When the book is at its apex, Friend *A* records an angle of 72° , while Friend *B* records an angle of 57° from the ground.



- a) Draw a picture of the mathematical experiment. Be sure to label all given quantities and unknowns (define your variables in the picture.)
 - b) How far is Friend *A*, from the base of the tower?
 - c) How far is Friend *B*, from the base of the tower?
 - d) How high above the ground did the book reach at its apex?
 - e) If friend *A* sprouted wings and flew to the point at which the book was at the apex, how far would friend *A* have to fly?
 - f) A problem like this can be found in *which* chapter of the precal book that is flying in the air?
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