

Part 1: Multiple-Choice—Choose the best answer from those provided. Write your answer clearly below. (30 questions, 3 points each)

Part 2: Free-Response—Solve each equation below. You must show all work in order to receive full credit. All of your answers should be in the interval  $[0, 2\pi)$ . (Approximately 5 points each)

|    |                              |
|----|------------------------------|
| 31 | $2\cos^2x - 5\cos x = 3$     |
| 32 | $-2\cos^2x - \sin x + 2 = 0$ |

Name \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.****Use basic identities to simplify the expression.**

1)  $\frac{\csc \theta \cot \theta}{\sec \theta}$  1) \_\_\_\_\_

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

2)  $\frac{1}{\cot^2 \theta} + \sec \theta \cos \theta$  2) \_\_\_\_\_

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

3)  $\cos \theta - \cos \theta \sin^2 \theta$  3) \_\_\_\_\_

- A)
- $\sec^2 \theta$
- B)
- $\tan^2 \theta$
- C)
- $\cos^3 \theta$
- D)
- $\sin \theta$

4)  $\sin^2 \theta + \tan^2 \theta + \cos^2 \theta$  4) \_\_\_\_\_

- A)
- $\sec^2 \theta$
- B)
- $\tan^2 \theta$
- C)
- $\sin \theta$
- D)
- $\cos^3 \theta$

5)  $\tan^2 \theta \csc^2 \theta$  5) \_\_\_\_\_

- A)
- $\sin \theta$
- B)
- $\cos^3 \theta$
- C)
- $\sec^2 \theta$
- D)
- $\tan^2 \theta$

**Simplify the expression.**

6)  $\cot x \tan x$  6) \_\_\_\_\_  
A)  $\csc x$                       B) 1                      C) -1                      D)  $\sin x$

7)  $\csc(-x) \sin(-x)$  7) \_\_\_\_\_  
A) -1                      B)  $-\cot x$                       C) 1                      D)  $\sec x$

8)  $\cos\left(\frac{\pi}{2} - x\right) \csc(-x)$  8) \_\_\_\_\_  
A)  $-\sin^2 x$                       B)  $-\cot x$                       C) 1                      D) -1

9)  $\csc\left(\frac{\pi}{2} - x\right) \cos(-x)$  9) \_\_\_\_\_  
A) -1                      B)  $\cos^2 x$                       C)  $-\csc^2 x$                       D) 1

10)  $\cot^2(x) - \csc^2(-x)$  10) \_\_\_\_\_  
A)  $\sec^2 x$                       B) -1                      C) 1                      D)  $-\tan^2 x$

11)  $(\sin^2 x + \cos^2 x) - (\csc^2 x - \cot^2 x)$  11) \_\_\_\_\_  
A) 0                      B)  $\sin^2 x$                       C) 2                      D)  $\cos^2 x$

12)  $\frac{\sin^2 x - 1}{\cos(-x)}$  12) \_\_\_\_\_  
 A)  $\cos x$  B)  $\sin x$  C)  $-\sin x$  D)  $-\cos x$

13)  $\frac{1 - \sin^2 x}{\sin x - \csc x}$  13) \_\_\_\_\_  
 A)  $\sin^2 x$  B)  $-\sin x$  C)  $-\cos x$  D)  $\cos^2 x$

14)  $\frac{\cos 2x + \sin 2x}{\cot 2x - \csc 2x}$  14) \_\_\_\_\_  
 A)  $\csc x$  B)  $\sec x$  C)  $-1$  D)  $1$

15)  $\frac{\csc 2x \sec x}{\sec 2x + \csc 2x}$  15) \_\_\_\_\_  
 A)  $\sin x$  B)  $\sec x$  C)  $\cot x$  D)  $\cos x$

16)  $\frac{1}{\csc x - \cot x} + \frac{1}{\csc x + \cot x}$  16) \_\_\_\_\_  
 A)  $\csc x$  B)  $2 \csc x$  C)  $\csc 2x$  D)  $2 \cot x$

17)  $\frac{1}{1 - \cos x} + \frac{1}{1 + \cos x}$  17) \_\_\_\_\_  
 A)  $2 \csc x$  B)  $2 \csc 2x$  C)  $\csc 2x$  D)  $2 \sec 2x$

18)  $\frac{\cos x}{1 - \sin x} + \frac{1 - \sin x}{\cos x}$  18) \_\_\_\_\_  
 A)  $2 \csc x$  B)  $2 \sec x$  C)  $2$  D)  $\sec 2x$

**Write each expression in factored form as an algebraic expression of a single trigonometric function.**

19)  $\csc 2x - 1$  19) \_\_\_\_\_  
 A)  $\csc x - 1$  B)  $\cot x$   
 C)  $(\cot x + 1)(\cot x - 1)$  D)  $(\csc x + 1)(\csc x - 1)$

20)  $4 \cot 2x - \frac{4}{\tan x} + \cos x \sec x$  20) \_\_\_\_\_  
 A)  $1$  B)  $(2 \tan x - 1)(2 \tan x + 1)$   
 C)  $(4 \tan x + 1)(\tan x + 1)$  D)  $(2 \cot x - 1)^2$

21)  $1 - 2 \sin^2 x + \sin^4 x$  21) \_\_\_\_\_  
 A)  $\cos^4 x$  B)  $\sin^2 x$  C)  $(1 - \sin^2 x)$  D)  $(1 + \tan^2 x)$

- 22)  $1 - \sin^3 x$  22) \_\_\_\_\_  
 A)  $(1 - \sin x)(1 - 2 \sin x + \sin^2 x)$  B)  $(1 - \sin x)^3$   
 C)  $(1 - \sin x)(\cos x + \sin^2 x)$  D)  $(1 - \sin x)(1 + \sin x + \sin^2 x)$

**Find all solutions in the interval  $[0, 2\pi)$ .**

- 23)  $2 \sin^2 x = \sin x$  23) \_\_\_\_\_  
 A)  $x = 0, \pi, \frac{\pi}{6}, \frac{5\pi}{6}$  B)  $x = \frac{\pi}{3}, \frac{2\pi}{3}$   
 C)  $x = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{\pi}{3}, \frac{2\pi}{3}$  D)  $x = \frac{\pi}{6}, \frac{5\pi}{6}$

- 24)  $\sec^2 x - 2 = \tan^2 x$  24) \_\_\_\_\_  
 A)  $x = \frac{\pi}{4}$  B) No solution C)  $x = \frac{\pi}{6}$  D)  $x = \frac{\pi}{3}$

- 25)  $\sin^2 x - \cos^2 x = 0$  25) \_\_\_\_\_  
 A)  $x = \frac{\pi}{4}, \frac{\pi}{6}$  B)  $x = \frac{\pi}{4}, \frac{\pi}{3}$   
 C)  $x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$  D)  $x = \frac{\pi}{4}$

- 26)  $7 \tan^3 x - 21 \tan x = 0$  26) \_\_\_\_\_  
 A)  $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$  B)  $0, \frac{\pi}{3}, \pi, \frac{4\pi}{3}$   
 C)  $0, \frac{\pi}{3}, \frac{2\pi}{3}, \pi, \frac{4\pi}{3}, \frac{5\pi}{3}$  D)  $0, \frac{\pi}{5}, \pi, \frac{6\pi}{5}$

**Find an exact value.**

- 27)  $\cos 15^\circ$  27) \_\_\_\_\_  
 A)  $\frac{-\sqrt{2} + \sqrt{6}}{4}$  B)  $\frac{-\sqrt{6} + 1}{4}$  C)  $\frac{-\sqrt{2} - \sqrt{6}}{4}$  D)  $\frac{\sqrt{6} + \sqrt{2}}{4}$

- 28)  $\sin 105^\circ$  28) \_\_\_\_\_  
 A)  $\frac{-\sqrt{6} - \sqrt{2}}{4}$  B)  $\frac{\sqrt{6} + \sqrt{2}}{4}$  C)  $\frac{-\sqrt{6} + \sqrt{2}}{4}$  D)  $\frac{\sqrt{6} - \sqrt{2}}{4}$

**Write the expression as the sine, cosine, or tangent of an angle.**

- 29)  $\sin 59^\circ \cos 15^\circ - \cos 59^\circ \sin 15^\circ$  29) \_\_\_\_\_  
 A)  $\cos 74^\circ$  B)  $\sin 44^\circ$  C)  $\sin 74^\circ$  D)  $\cos 44^\circ$

**Rewrite with only  $\sin x$  and  $\cos x$ .**

- 30)  $\cos 2x + \sin x$  30) \_\_\_\_\_  
 A)  $1 + 3 \sin^2 x$  B)  $1 + 3 \sin x$   
 C)  $1 - 2 \sin^2 x + \sin x$  D)  $1 + 2 \sin^2 x + \sin x$

## Answer Key

Testname: SPC\_CH5REVIEW

- 1) D
- 2) C
- 3) C
- 4) A
- 5) C
- 6) B
- 7) C
- 8) D
- 9) D
- 10) B
- 11) A
- 12) D
- 13) B
- 14) C
- 15) D
- 16) B
- 17) B
- 18) B
- 19) D
- 20) D
- 21) A
- 22) D
- 23) A
- 24) B
- 25) C
- 26) C
- 27) D
- 28) B
- 29) B
- 30) C