This review is identical in format to the Ch.5 Exam. Only the actual numerical values and particular equations will vary.

Multiple-Choice:
Record all answers to the multiple-choice questions here. To clearly distinguish between A and D, it is recommended that you use capital letters. *(2 points each)*

Free-Response: *(40 points…points are listed in italics next to each problem)*
You must show a reasonable amount of work that leads to your answer. Where it is impossible to show your work, explain the mental leaps that you made to draw your conclusion. Where estimation is required, round or truncate all answer to the thousandths place.

31. Solve $\sqrt{3}cscx - 2 = 0$ for all possible values of x in the interval $[0,2\pi)$. *(5 points)*

32. Solve $tan3x(tanx - 1) = 0$ for all possible values of x in the interval $[0,2\pi)$.
(8 points)

33. Solve $tan^2x - secx = 1$ for all possible values of x in the interval$[0,2\pi)$.
(9 points)

34. Given $sinu = \frac{5}{13}$, $cosv = \frac{3}{5}$, and that both u and v lie in Quadrant II. Find $sin(u - v)$.
(8 points)

35. Rewrite $cos(arccosx + arcsinx)$ as an algebraic expression (no trigonometric functions.) *(10 points)*

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Use basic identities to simplify the expression.

1) $\dfrac{\csc \theta \cot \theta}{\sec \theta}$ 1) _____

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

2) $\dfrac{\tan \theta}{\cot \theta}$ 2) _____

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

3) $\sin^2\theta + \tan^2\theta + \cos^2\theta$ 3) _____

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

4) $\dfrac{\tan \theta}{\sec \theta}$ 4) _____

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

5) $\sin \theta \cos \theta \sec \theta \csc \theta$ 5) _____

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

Simplify the expression.

6) $\cot x \tan x$ 6) _____

    A) 1   B) –1   C) $\csc x$ D) $\sin x$

7) $\sec (-x) \cos (-x)$ 7) _____

    A) $-\tan x$ B) 1   C) –1   D) $\cot x$

8) $\cos \left(\dfrac{\pi}{2} - x \right) \csc (-x)$ 8) _____

    A) 1   B) $-\cot x$ C) $-\sin^2 x$ D) –1

9) $\dfrac{\cos \left(\dfrac{\pi}{2} - x \right) \tan x}{\sin^2 x}$ 9) _____

    A) $\sec x$ B) $\sin^2 x$ C) $\tan x$ D) $\csc x$

10) $(\sin^2 x + \cos^2 x) - (\csc^2 x - \cot^2 x)$ 10) _____

    A) $\cos^2 x$ B) 2   C) $\sin^2 x$ D) 0

11) $\dfrac{1 - \sin^2 x}{\sin x - \csc x}$

<div align="right">11) _____</div>

    A) $\cos^2 x$ B) $-\sin x$ C) $\sin^2 x$ D) $-\cos x$

12) $\cos x + \sin x \tan x$

<div align="right">12) _____</div>

    A) $\cot x - 1$ B) $\csc x$ C) $\tan x - 1$ D) $\sec x$

13) $\dfrac{(\csc y + \cot y)(\csc y - \cot y)}{\csc y}$

<div align="right">13) _____</div>

    A) $\cos y$ B) $\sin y$ C) $-\sin y$ D) $\csc y$

14) $\dfrac{\cot x}{\sec^2 x} + \dfrac{\cot x}{\csc^2 x}$

<div align="right">14) _____</div>

    A) $\cot^2 x$ B) $\sin x$ C) $\cot x$ D) $\tan x$

15) $\dfrac{1}{1 - \cos x} + \dfrac{1}{1 + \cos x}$

<div align="right">15) _____</div>

    A) $\csc^2 x$ B) $2 \csc^2 x$ C) $2 \sec^2 x$ D) $2 \csc x$

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

16) $\csc^2 x - 1$

<div align="right">16) _____</div>

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

17) $4 \cot^2 x - \dfrac{4}{\tan x} + \cos x \sec x$

<div align="right">17) _____</div>

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

18) $1 - 2 \sin^2 x + \sin^4 x$

<div align="right">18) _____</div>

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

19) $1 - \sin^3 x$

<div align="right">19) _____</div>

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

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

20) $\cos x = \sin x$

<div align="right">20) _____</div>

    A) $x = \dfrac{\pi}{4}, \dfrac{5\pi}{4}$ B) $x = \dfrac{3\pi}{4}, \dfrac{5\pi}{4}$ C) $x = \dfrac{3\pi}{4}, \dfrac{7\pi}{2}$ D) $x = \dfrac{\pi}{4}, \dfrac{7\pi}{4}$

21) $\sec^2 x - 2 = \tan^2 x$

    A) $x = \dfrac{\pi}{3}$ B) No solution   C) $x = \dfrac{\pi}{6}$ D) $x = \dfrac{\pi}{4}$

22) $\sin^2 x + \sin x = 0$

    A) $x = 0,\ \pi,\ \dfrac{\pi}{3},\ \dfrac{2\pi}{3}$ B) $x = 0,\ \pi,\ \dfrac{3\pi}{2}$

    C) $x = 0,\ \pi,\ \dfrac{\pi}{3},\ \dfrac{5\pi}{3}$ D) $x = 0,\ \pi,\ \dfrac{4\pi}{3},\ \dfrac{5\pi}{3}$

Find all solutions to the equation.

23) $\cos x = -\dfrac{1}{2}$ (Express your answer in radians, in exact form.)

    A) $\left\{ \dfrac{5\pi}{6} + 2n\pi,\ \dfrac{7\pi}{6} + 2n\pi \mid n = 0,\ \pm 1,\ \pm 2,\ .... \right\}$

    B) $\left\{ \dfrac{5\pi}{6} + n\pi \mid n = 0,\ \pm 1,\ \pm 2,\ .... \right\}$

    C) $\left\{ \dfrac{2\pi}{3} + n\pi \mid n = 0,\ \pm 1,\ \pm 2,\ .... \right\}$

    D) $\left\{ \dfrac{2\pi}{3} + 2n\pi,\ \dfrac{4\pi}{3} + 2n\pi \mid n = 0,\ \pm 1,\ \pm 2,\ .... \right\}$

24) $\cos^2 x + 2\cos x + 1 = 0$

    A) $\left\{ \pi + 2n\pi \mid n = 0,\ \pm 1,\ \pm 2,\ .... \right\}$

    B) $\left\{ n\pi \mid n = 0,\ \pm 1,\ \pm 2,\ .... \right\}$

    C) $\left\{ \dfrac{3\pi}{2} + 2n\pi \mid n = 0,\ \pm 1,\ \pm 2,\ .... \right\}$

    D) $\left\{ \dfrac{\pi}{4} + 2n\pi,\ \dfrac{3\pi}{4} + 2n\pi \mid n = 0,\ \pm 1,\ \pm 2,\ .... \right\}$

Find all solutions to the equation in the interval [0, 2π).

25) $\sin 2x = -\sin x$

    A) $\dfrac{\pi}{8},\ \dfrac{9\pi}{8}$ B) No solution

    C) $\dfrac{\pi}{4},\ \dfrac{3\pi}{4},\ \dfrac{5\pi}{4},\ \dfrac{7\pi}{4}$ D) $0,\ \dfrac{2\pi}{3},\ \pi,\ \dfrac{4\pi}{3}$

26) $2\cos x + \sin 2x = 0$

    A) $0,\ \dfrac{\pi}{4},\ \dfrac{3\pi}{4},\ \dfrac{\pi}{2}$ B) $0,\ \dfrac{\pi}{2},\ \pi,\ \dfrac{3\pi}{2}$ C) $\dfrac{\pi}{2},\ \dfrac{3\pi}{2}$ D) $0,\ \pi,\ \dfrac{3\pi}{2}$

27) $\cos 4x - \cos 2x = 0$

A) $\dfrac{\pi}{6}, \dfrac{\pi}{2}, \dfrac{5\pi}{6}, \dfrac{7\pi}{6}, \dfrac{3\pi}{2}, \dfrac{11\pi}{6}$

B) $0, \dfrac{2\pi}{3}, \dfrac{4\pi}{3}$

C) $0, \dfrac{\pi}{3}, \dfrac{2\pi}{3}, \pi, \dfrac{4\pi}{3}, \dfrac{5\pi}{3}$

D) No solution

27) _____

Rewrite with only sin x and cos x.

28) $\sin 2x - \cos 2x$

A) $2\sin^2 x - 2\sin x \cos x - 1$ B) $2\sin x$

C) $2\sin^2 x + 2\sin x \cos x - 1$ D) $2\sin^2 x - 2\sin x \cos x + 1$

28) _____

29) $\cos 2x - \sin x$

A) $\cos^2 x - \sin^3 x$ B) $\cos^2 x + \sin^2 x + \sin x$

C) $\cos^2 x - 3\sin x$ D) $\cos^2 x - \sin^2 x - \sin x$

29) _____

30) $\sin 2x - \cos 3x$

A) $2\sin x \cos x + \cos x - 4\cos x \sin^2 x$

B) $3\sin^2 x \cos x - \sin^3 x + 2\sin x \cos x$

C) $\cos^3 x + 2\sin^2 x \cos x - \sin^2 x + 2\sin x \cos x$

D) $2\sin^2 x \cos x - \cos^3 x - 2\sin x \cos x$

30) _____

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Answer Key
Testname: HA2PC_CH5(PC)_REVIEWMC

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