Sections 6.7, 7.2, 7.3, 7.4 and 7.6 upto question #34

1. Given triangle ABC with $\gamma = 90^\circ$, $\beta = 25^\circ\ 13'$, and $b = 52.1$, approximate c to the nearest tenth of a unit.

   A. 122.3

   B. 96.9

   C. 57.6

   D. 110.6

   E. None of the above

2. Express side a in terms of side b and angle β in triangle ABC with $\gamma = 90^\circ$.

   A. $a = b\tan\beta$

   B. $a = b\csc\beta$

   C. $a = b\sec\beta$

   D. $a = b\sin\beta$

   E. $a = b\cot\beta$

3. Express as a trigonometric function of one angle.

   $\cos(49°)\cos(13°) - \sin(49°)\sin(13°)$

   A. sin(62°)

   B. cos(62°)

   C. sin(36°)

   D. cos(36°)

   E. None of the above

Sections 6.7, 7.2, 7.3, 7.4 and 7.6 upto question #34

4. Find all the solutions of the equation using *n* as an arbitrary integer.

$$2\cos\left(\frac{1}{6}\theta\right)-\sqrt{3}=0$$

A. $\theta=\frac{4\pi}{3}+2\pi n,\frac{5\pi}{3}+2\pi n$

B. $\theta=6\pi+2\pi n,10\pi+2\pi n$

C. $\theta=\frac{3\pi}{2}+12\pi n,\frac{21\pi}{2}+12\pi n$

D. $\theta=\pi+12\pi n,11\pi+12\pi n$

E. None of the above

5. A person flying a kite holds the string 5 feet above the level ground. The string of the kite is taut and makes an angle of 44º with the horizontal. Approximate, to the nearest foot, the height of the kite above level ground if 600 feet of string is played out.

A. 584 feet

B. 437 feet

C. 422 feet

D. 518 feet

E. None of the above

Sections 6.7, 7.2, 7.3, 7.4 and 7.6 upto question #34

6. If $\sec(\alpha)=\frac{13}{12}$ and $\sin(\beta)=\frac{4}{\sqrt{65}}$ for a fourth-quadrant angle α and a second-quadrant angle β, find the exact value of $\sin(\alpha-\beta)$.

A. $\frac{-104}{13\sqrt{65}}$

B. $\frac{-1}{\sqrt{65}}$

C. $\frac{-83}{13\sqrt{65}}$

D. $\frac{-64}{13\sqrt{65}}$

E. None of the above

7. A ship leaves port at 2:00 pm and sails in the direction N41ºE at a rate of 31 mph. At 3:00 pm, a second ship leaves the same port in the direction N49ºW at a rate of 21 mph. Approximate the bearing, to the nearest degree, from the first ship to the second ship at 5:00 pm.

A. S 17º W

B. S 24º W

C. S 65º W

D. S 69º W

E. None of the above

Sections 6.7, 7.2, 7.3, 7.4 and 7.6 upto question #34

8. $\cos\left(\theta-\frac{\pi}{3}\right)$ is equivalent to which of the following?

A. $\frac{\sqrt{2}}{2}(\sin\theta-\cos\theta)$

B. $\frac{1}{2}\left(\sin\theta-\sqrt{3}\cos\theta\right)$

C. $\frac{\sqrt{2}}{2}(\sin\theta+\cos\theta)$

D. $\frac{1}{2}\left(\sqrt{3}\sin\theta+\cos\theta\right)$

E. None of the above

9. Find the exact value of $\tan(2\theta)$ if $\sec(\theta)=-8$ and $90°<\theta<180°$.

A. $\frac{\sqrt{65}}{32}$

B. $\frac{-\sqrt{63}}{31}$

C. $\frac{\sqrt{63}}{31}$

D. $\frac{-\sqrt{65}}{32}$

E. None of the above

Sections 6.7, 7.2, 7.3, 7.4 and 7.6 upto question #34

10. Find the exact solutions that are in the interval [0, 2π).

$$\sin(2t)+\cos(t)=0$$

A. $\frac{\pi}{2},\frac{3\pi}{2},\frac{7\pi}{6},\frac{11\pi}{6}$

B. $0,\pi,\frac{\pi}{6},\frac{5\pi}{6}$

C. $0,\pi,\frac{7\pi}{6},\frac{11\pi}{6}$

D. $\frac{\pi}{2},\frac{3\pi}{2},\frac{\pi}{6},\frac{5\pi}{6}$

E. None of the above

11. Find the exact value of the expression.

$$\tan^{-1}\left(\tan\frac{4\pi}{3}\right)$$

A. $-\frac{\pi}{3}$

B. $\frac{4\pi}{3}$

C. $-\frac{2\pi}{3}$

D. $\frac{2\pi}{3}$

E. None of the above

Sections 6.7, 7.2, 7.3, 7.4 and 7.6 upto question #34

12. Find the exact value of the expression.

$$\sin\left[\cos^{-1}\left(\frac{-3}{8}\right)\right]$$

A. $\frac{-23}{32}$

B. $\frac{\sqrt{55}}{8}$

C. $\frac{-\sqrt{55}}{8}$

D. $\frac{3\sqrt{55}}{32}$

E. None of the above

13. Write the expression as an algebraic expression in x for $x > 0$.

$$\sin\left(\tan^{-1} x\right)$$

A. $\frac{1}{\sqrt{x^2+1}}$

B. $\frac{2x}{x^2+1}$

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

D. $\frac{x}{\sqrt{x^2+1}}$

E. None of the above

Sections 6.7, 7.2, 7.3, 7.4 and 7.6 upto question #34

14. Find the number of solutions of the equation that are in the interval $[0, 2\pi)$.

$\cos^2 x + 2\cos x - 3 = 0$

A. 1 solution

B. 4 solutions

C. 3 solutions

D. 2 solutions

E. 0 solutions (undefined)

15. A drawbridge is 210 feet long when stretched across a river. The two equal sections of the bridge can be rotated upward through an angle of 32º with the horizontal. Approximate, to the nearest tenth of a foot, how far apart the ends of the two sections are when the bridge is fully opened.

A. 31.9 feet

B. 98.7 feet

C. 78.8 feet

D. 69.8 feet

E. None of the above

Sections 6.7, 7.2, 7.3, 7.4 and 7.6 upto question #34

Question	Answer	Letter
1.	122.3	A
2.	$a = b\cot\beta$	E
3.	$\cos(62°)$	B
4.	$\theta = \pi + 12\pi n, 11\pi + 12\pi n$	D
5.	422 feet	C
6.	$\frac{-1}{\sqrt{65}}$	B
7.	S 65º W	C
8.	$\frac{1}{2}\left(\sqrt{3}\sin\theta + \cos\theta\right)$	D
9.	$\frac{\sqrt{63}}{31}$	C
10.	$\frac{\pi}{2}, \frac{3\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}$	A
11.	$\frac{\pi}{3}$	E
12.	$\frac{\sqrt{55}}{8}$	B
13.	$\frac{x}{\sqrt{x^2+1}}$	D
14.	$x = 0$, (1 solution)	A
15.	31.9 feet	A