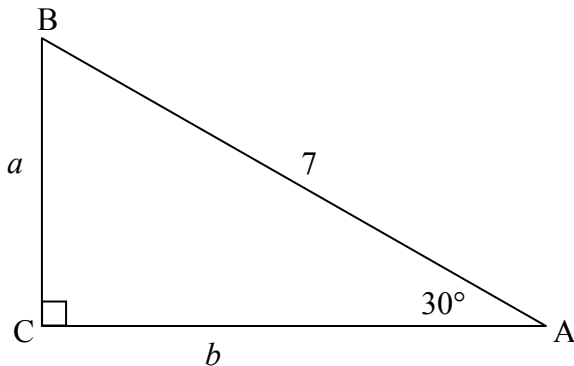


Covers all of Sections 6.7, 7.2, 7.3, 7.4 and Section 7.6 up to question #34

1. Given  $\triangle ABC$ , with  $\gamma = 90^\circ$ , find the exact values of sides  $a$  and  $b$ .



A.  $a = \frac{7}{2}, b = 7\sqrt{3}$

B.  $a = 14, b = \frac{7\sqrt{3}}{2}$

C.  $a = \frac{7}{2}, b = \frac{7\sqrt{3}}{2}$

D.  $a = 14, b = 7\sqrt{3}$

E. None of the above

2. Express as a trigonometric function of one angle.

$$\cos 46^\circ \cos 12^\circ + \sin 46^\circ \sin 12^\circ$$

A.  $\cos(34^\circ)$

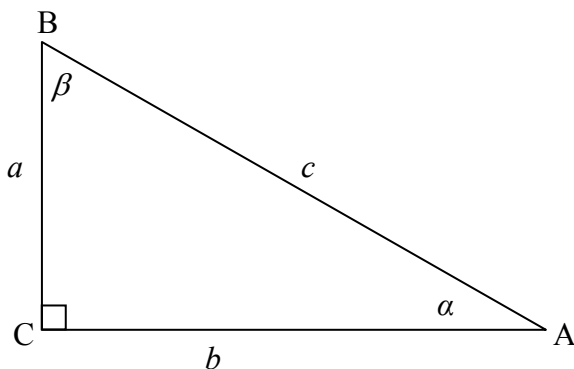
B.  $\sin(58^\circ)$

C.  $\cos(58^\circ)$

D.  $\sin(34^\circ)$

E. None of the above

3. Given  $\triangle ABC$ , with  $\gamma = 90^\circ$ , express side  $c$ , in terms of angle  $\alpha$  and side  $b$ .



A.  $c = b \tan \alpha$

B.  $c = b \sec \alpha$

C.  $c = b \sin \alpha$

D.  $c = b \csc \alpha$

E.  $c = b \cos \alpha$

Covers all of Sections 6.7, 7.2, 7.3, 7.4 and Section 7.6 up to question #34

4. An airplane flying at an altitude of 17,500 feet passes directly over a fixed object on the ground. **Two minutes later**, the angle of depression of the object is  $34^\circ$ . Approximate the speed of the airplane to the nearest mile per hour. (1 mile = 5280 feet)

- A. 134 *mph*
- B. 147 *mph*
- C. 67 *mph*
- D. 295 *mph*
- E. None of the above

Problems 5 and 6: An airplane, flying at a speed of 370 mph, leaves Point A in the direction of  $240^\circ$  for 1 hour. It then flies in the direction  $330^\circ$  for 2.5 hours.

5. To the nearest whole degree, what direction does it travel to return to Point A?
- A.  $55^\circ$
  - B.  $163^\circ$
  - C.  $38^\circ$
  - D.  $128^\circ$
  - E. None of the above
6. To the nearest tenth of an hour, how long will it take to return to Point A?
- A. 3.1 hours
  - B. 3.0 hours
  - C. 2.2 hours
  - D. 2.4 hours
  - E. None of the above

Covers all of Sections 6.7, 7.2, 7.3, 7.4 and Section 7.6 up to question #34

7. Find all solutions of the equation using  $n$  as an arbitrary integer.

$$\sqrt{3} \sec \beta + 2 = 0$$

- A.  $\beta = \frac{2\pi}{3} + 2\pi n, \frac{4\pi}{3} + 2\pi n$   
B.  $\beta = \frac{7\pi}{6} + 2\pi n, \frac{11\pi}{6} + 2\pi n$   
C.  $\beta = \frac{5\pi}{6} + 2\pi n, \frac{7\pi}{6} + 2\pi n$   
D.  $\beta = \frac{4\pi}{3} + 2\pi n, \frac{5\pi}{3} + 2\pi n$   
E. None of the above

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

$$\tan\left(2x - \frac{\pi}{4}\right) = \frac{1}{\sqrt{3}}$$

- A.  $\frac{5\pi}{24}, \frac{17\pi}{24}, \frac{29\pi}{24}, \frac{41\pi}{24}$   
B.  $\frac{11\pi}{24}, \frac{23\pi}{24}, \frac{35\pi}{24}, \frac{47\pi}{24}$   
C.  $\frac{7\pi}{24}, \frac{19\pi}{24}, \frac{31\pi}{24}, \frac{43\pi}{24}$   
D.  $\frac{\pi}{24}, \frac{13\pi}{24}, \frac{25\pi}{24}, \frac{37\pi}{24}$   
E. None of the above

Covers all of Sections 6.7, 7.2, 7.3, 7.4 and Section 7.6 up to question #34

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

$$\csc^2 \theta - 3 \csc \theta + 2 = 0$$

- A.  $0, \frac{\pi}{3}, \frac{5\pi}{3}$   
B.  $\frac{\pi}{3}, \frac{5\pi}{3}, \frac{3\pi}{2}$   
C.  $0, \frac{\pi}{6}, \frac{5\pi}{6}$   
D.  $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{\pi}{2}$   
E. Undefined

10. If  $\tan \alpha = \frac{-4}{3}$  and  $\cos \beta = \frac{8}{11}$  for a second-quadrant angle  $\alpha$  and a fourth-quadrant angle  $\beta$ , find  $\sin(\alpha + \beta)$ .

- A.  $\frac{3\sqrt{57} - 32}{55}$   
B.  $\frac{32 + 3\sqrt{57}}{55}$   
C.  $\frac{-32 - 3\sqrt{57}}{55}$   
D.  $\frac{32 - 3\sqrt{57}}{55}$   
E. None of the above

Covers all of Sections 6.7, 7.2, 7.3, 7.4 and Section 7.6 up to question #34

11.  $(\sin t + \cos t)^2$  is equivalent to which of the following?

- A.  $1 + \cos 2t$
- B.  $\sin 2t + \cos 2t$
- C. 1
- D.  $\sin 2t + \cos 2t + 1$
- E.  $1 + \sin 2t$

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

$$\sin 2t - \sin t = 0$$

- A.  $0, \pi, \frac{\pi}{3}, \frac{5\pi}{3}$
- B.  $\frac{\pi}{2}, \frac{3\pi}{2}, \frac{\pi}{3}, \frac{5\pi}{3}$
- C.  $0, \pi, \frac{\pi}{6}, \frac{11\pi}{6}$
- D.  $\frac{\pi}{2}, \frac{3\pi}{2}, \frac{\pi}{6}, \frac{11\pi}{6}$
- E. None of the above

13. Complete: As  $x \rightarrow -\infty$ ,  $\tan^{-1} x \rightarrow$  \_\_\_\_\_

- A.  $-\infty$
- B.  $\frac{\pi}{2}$
- C.  $\infty$
- D.  $-\frac{\pi}{2}$
- E. None of the above

Covers all of Sections 6.7, 7.2, 7.3, 7.4 and Section 7.6 up to question #34

14. If  $\tan \theta = \frac{-7}{4}$ , for  $90^\circ < \theta < 180^\circ$ , find the exact value of  $\cos(2\theta)$ .

A.  $\frac{33}{65}$

B.  $\frac{-56}{65}$

C.  $\frac{-33}{65}$

D.  $\frac{56}{65}$

E. None of the above

15. Find the exact value of the expression  $\cos^{-1}\left(\cos\frac{4\pi}{3}\right)$

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

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

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

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

E. None of the above

Covers all of Sections 6.7, 7.2, 7.3, 7.4 and Section 7.6 up to question #34

## Exam 2 Answers

Question	Answer	Letter
1.	$a = \frac{7}{2}, b = \frac{7\sqrt{3}}{2}$	C
2.	$\cos(34^\circ)$	A
3.	$c = b \sec \alpha$	B
4.	147 mph	B
5.	$128^\circ$	D
6.	2.7 hours (None of the above)	E
7.	$\beta = \frac{5\pi}{6} + 2\pi n, \frac{7\pi}{6} + 2\pi n$	C
8.	$\frac{5\pi}{24}, \frac{17\pi}{24}, \frac{29\pi}{24}, \frac{41\pi}{24}$	A
9.	$\frac{\pi}{6}, \frac{5\pi}{6}, \frac{\pi}{2}$	D
10.	$\frac{32 + 3\sqrt{57}}{55}$	B
11.	$1 + \sin 2t$	E
12.	$0, \pi, \frac{\pi}{3}, \frac{5\pi}{3}$	A
13.	$\frac{-\pi}{2}$	D
14.	$\frac{-33}{65}$	C
15.	$\frac{2\pi}{3}$	B