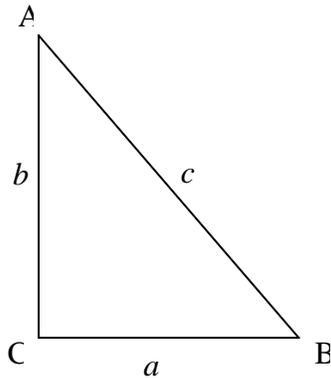


This exam covers Sections 6.7, 7.2, 7.3, 7.4 and 7.6 (up to question 14).

1. Given $\triangle ABC$ with $\angle C = 90^\circ$, express c in terms of a and b .

- A. $c = a \cos$ B. $c = \frac{a}{\cos}$ C. $c = a \sin$ D. $c = \frac{a}{\sin}$ E. None of these.



2. Find all the solutions of the equation $\tan \theta = -\sqrt{3}$.

- A. $\theta = \frac{5}{3} + n\pi$ B. $\theta = \frac{5}{6} + 2n\pi$ C. $\theta = \frac{5}{6} + n\pi$ D. $\theta = \frac{5}{3} + 2n\pi$ E. None of these

3. From the edge of a cliff, 100 meters above level ground, a hiker spots his friend on the ground. If the angle of depression of the hiker to his friend is 31° , how far does the friend have to walk in order to be directly below the hiker? Round to the nearest meter.

- A. 166 meters B. 60 meters C. 86 meters D. 51 meters E. None of these.

This exam covers Sections 6.7, 7.2, 7.3, 7.4 and 7.6 (up to question 14).

4. Find all solutions of the equation $\cos \frac{1}{4}x = \frac{\sqrt{3}}{2}$, where n is an integer.

A. $x = \frac{4}{3} + 8n, x = \frac{20}{3} + 8n$

B. $x = \frac{4}{12} + \frac{2}{2}n, x = \frac{5}{12} + \frac{2}{2}n$

C. $x = \frac{4}{24} + \frac{2}{2}n, x = \frac{11}{24} + \frac{2}{2}n$

D. $x = \frac{2}{3} + 8n, x = \frac{22}{3} + 8n$

E. None of these.

5. How many solutions of $2\cos^2 t - 3\cos t + 1 = 0$ are in the interval $[0, 2\pi)$?

A. 0

B. 1

C. 2

D. 3

E. 4

6. Find the exact value of $\sin^{-1} \sin \frac{7}{6}$.

A. $\frac{7}{6}$

B. $-\frac{7}{6}$

C. $\frac{11}{6}$

D. $\frac{5}{6}$

E. None of these.

This exam covers Sections 6.7, 7.2, 7.3, 7.4 and 7.6 (up to question 14).

Questions 7 and 8:

At 1:00 PM, a ship leaves port and sails in the direction of $N55^\circ W$ at a rate of 60 mph. A second ship leaves the same port at the same time and sails in the direction of $S35^\circ W$ at a rate of 20 mph.

7. Approximately how far apart are the two ships at 4:00 PM?

- A. 72 miles B. 63 miles C. 126 miles D. 184 miles E. 190 miles

8. What is the bearing, to the nearest degree, from the first ship to the second?

- A. $S17^\circ E$ B. $S37^\circ E$ C. $S32^\circ E$ D. $S18^\circ E$ E. $S53^\circ E$

This exam covers Sections 6.7, 7.2, 7.3, 7.4 and 7.6 (up to question 14).

9. $\cos x + \frac{1}{4}$ is equivalent to which of the following?

- A. $\frac{1}{2}(\sqrt{3}\cos x + \sin x)$ B. $\frac{1}{\sqrt{2}}(\cos x - \sin x)$ C. $\frac{1}{2}(\sqrt{3}\cos x - \sin x)$
D. $\frac{1}{\sqrt{2}}(\cos x + \sin x)$ E. $\frac{1}{2}(\cos x + \sqrt{3}\sin x)$

10. If α and β are acute angles such that $\cos \alpha = \frac{9}{41}$ and $\tan \beta = \frac{3}{4}$, find $\tan(\alpha + \beta)$.

- A. $-\frac{187}{84}$ B. $\frac{187}{156}$ C. $-\frac{187}{156}$ D. $\frac{187}{84}$ E. None of these.

11. Express $\sin 73^\circ \cos 18^\circ - \sin 18^\circ \cos 73^\circ$ as a trigonometric function of one angle.

- A. $\tan 39^\circ$ B. $\sin 91^\circ$ C. $\cos 55^\circ$ D. $\sin 55^\circ$ E. $\cos 91^\circ$

This exam covers Sections 6.7, 7.2, 7.3, 7.4 and 7.6 (up to question 14).

12. Find the exact value of $\sin(2\theta)$ for $\sec \theta = -\frac{25}{7}$ and $180^\circ < \theta < 270^\circ$.

- A. $-\frac{336}{625}$ B. $\frac{527}{625}$ C. $\frac{336}{625}$ D. $-\frac{527}{625}$ E. None of these.

13. Find the solutions of the equation $2\cos 2\theta = 1 - 2\sin^2 \theta$ that are in the interval $[0, 2\pi)$.

- A. $\frac{2}{3}, \frac{4}{3}, \frac{5}{3}, \frac{5}{3}$ B. $\frac{5}{6}, \frac{7}{6}, \frac{7}{6}, \frac{11}{6}$ C. $\frac{3}{4}, \frac{3}{4}, \frac{5}{4}, \frac{7}{4}$
D. $0, \frac{\pi}{2}, \frac{3\pi}{2}$ E. None of these.

This exam covers Sections 6.7, 7.2, 7.3, 7.4 and 7.6 (up to question 14).

MA 154, Fall 2002 Exam 2 Answers

Question	Letter	Answer
1.	B	$c = \frac{a}{\cos}$
2.	E (None of these)	$= \frac{2}{3} + n$
3.	A	166 meters
4.	D	$x = \frac{2}{3} + 8$ $n, x = \frac{22}{3} + 8$ n
5.	D	3
6.	E (None of these)	$-\frac{1}{6}$
7.	E	190 miles
8.	B	S37°E
9.	B	$\frac{1}{\sqrt{2}}(\cos x - \sin x)$
10.	A	$-\frac{187}{84}$
11.	D	$\sin 55^\circ$
12.	C	$\frac{336}{625}$
13.	C	$\frac{3}{4}, \frac{5}{4}, \frac{7}{4}$