# MA 15400

# Spring 2011

# Exam 1

| PYTHAGOREAN IDENTITIES | | |
|---|---|---|
| $\sin^2\theta + \cos^2\theta = 1$ | $1 + \tan^2\theta = \sec^2\theta$ | $1 + \cot^2\theta = \csc^2\theta$ |

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Covers Lessons 1 to 11, which include all of Sections 6.1, 6.2, 6.3, 6.4, and 6.5

1. Which of the following are **not** coterminal angles with $\theta = -150°$?

   A. $\frac{5\pi}{6}, \frac{17\pi}{6}$

   B. $210°, -510°$

   C. $\frac{-17\pi}{6}, \frac{31\pi}{6}$

   D. $930°, -870°$

   E. All of the above are coterminal angles.

2. Find the complementary angle to $\theta = 17°\ 4'\ 12''$.

   A. $162°18'40''$

   B. $72°55'48''$

   C. $72°18'40''$

   D. $162°55'48''$

   E. None of the above.

3. Find the area of the sector of the circle with radius 7.9 cm, whose central angle $\theta$ subtends an arc of 5.6 cm. Round your answer to one decimal place.

   A. $31.1cm^2$

   B. $62.1cm^2$

   C. $11.1cm^2$

   D. $22.1cm^2$

   E. None of the above.

4. A pendulum in a grandfather clock is 5 feet long and swings back and forth along an 8 inch arc. Approximate the angle, to the nearest tenth of a degree, through which the pendulum passes during one swing. (12 inches = 1 foot)

A. $6.8°$

B. $7.5°$

C. $6.7°$

D. $7.6°$

E. None of the above.

5. Stonehenge was constructed using solid stone blocks weighting over 99,000 pounds each. Lifting a single stone required 550 people, who pulled the stone up a ramp inclined at an angle of $9°$. Approximate the distance the stone was moved along the ramp in order to raise it to a height of 40 feet? Round your answer to the nearest foot.

A. 256 *feet*

B. 157 *feet*

C. 213 *feet*

D. 194 *feet*

E. None of the above.

6. Approximate to four decimal places.

$\cot(159°)$

A. $-1.0711$

B. $0.0001$

C. $2.7904$

D. $-2.6051$

E. None of the above.

7. Which of the following is equivalent to: $\cos^2\theta\left(\sec^2\theta+\csc^2\theta\right)$

A. $\sec^2\theta$

B. $\tan^2\theta$

C. $\csc^2\theta$

D. $\sin^2\theta$

E. $\cot^2\theta$

8. Find the exact value of $\cos\theta$, if $\theta$ is in standard position and the terminal side of $\theta$ is in *QII* and parallel to the line $7x+4y=12$.

A. $\frac{7}{\sqrt{65}}$

B. $\frac{-4}{\sqrt{65}}$

C. $\frac{-7}{\sqrt{65}}$

D. $\frac{4}{\sqrt{65}}$

E. None of the above.

9. Which of the following is equivalent to: $\frac{\sin(-x)}{\cos(-x)}$

A. $-\tan x$

B. $-\cot\theta$

C. $\tan x$

D. $\cot\theta$

E. $\csc x$

10. Let $P(t)$ be the point that the terminal side of the angle $t$ intersects the unit circle. If $P(t)=\left(\frac{-24}{25},\frac{-7}{25}\right)$, find $P(-t)$.

A. $\left(\frac{-24}{25},\frac{-7}{25}\right)$

B. $\left(\frac{24}{25},\frac{-7}{25}\right)$

C. $\left(\frac{-24}{25},\frac{7}{25}\right)$

D. $\left(\frac{24}{25},\frac{7}{25}\right)$

E. None of the above.

11. As $x\to\frac{3\pi}{2}^{+}$, $\tan(x)\to$ _____

A. *undefined*

B. $-\infty$

C. $0$

D. $\infty$

E. $1$

12. Find the exact value of $\csc\left(\frac{4\pi}{3}\right)$.

A. $\frac{2}{\sqrt{3}}$

B. $\sqrt{2}$

C. $-\sqrt{2}$

D. $\frac{-2}{\sqrt{3}}$

E. None of the above

13. Approximate to the nearest $0.01$ radians, all angles $\theta$ in the interval $[0,2\pi)$ that satisfy the equation: $\sec\theta = 1.4682$

A. $2.32, 3.96$

B. $0.82, 3.96$

C. $2.32, 5.46$

D. $0.82, 5.46$

E. None of the above

14. Find the period and phase shift of the following function.

$$y = 5\sin\left(\frac{1}{4}x - \frac{3\pi}{4}\right)$$

A. $Period = \frac{\pi}{2}, Phase\ Shift = 3\pi$

B. $Period = 8\pi, Phase\ Shift = 3\pi$

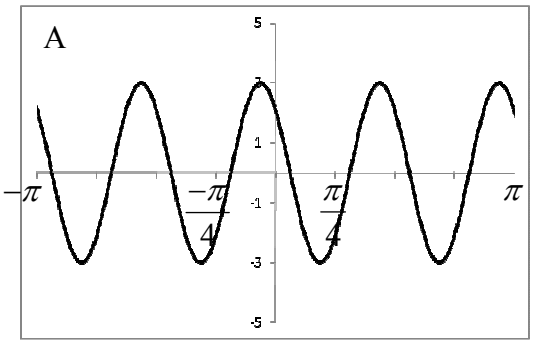
C. $Period = \frac{\pi}{2}, Phase\ Shift = \frac{3\pi}{16}$

D. $Period = 8\pi, Phase\ Shift = \frac{3\pi}{16}$

E. None of the above

15. Find the graph of the function $y = 3\sin\left(2x + \frac{\pi}{4}\right)$.

A

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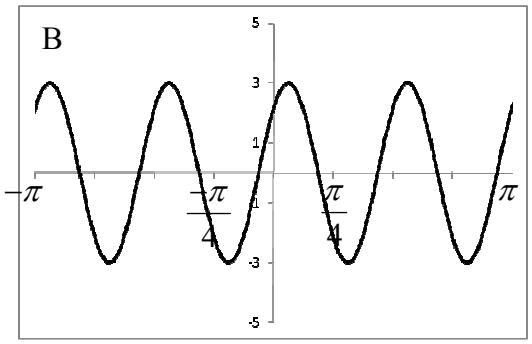


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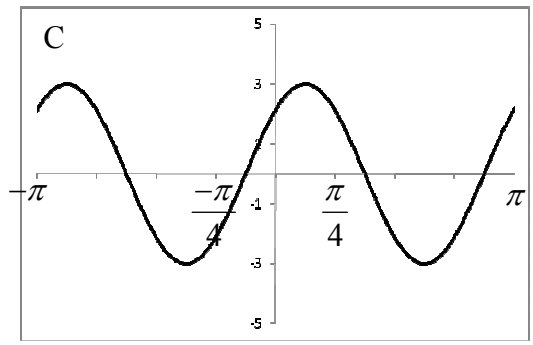


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