

MA 15400

Fall 2012

Exam 1

PYTHAGOREAN IDENTITIES

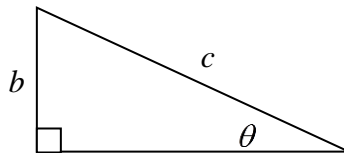
$$\sin^2 \theta + \cos^2 \theta = 1$$

$$1 + \tan^2 \theta = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

Covers Lessons 1 to 11, Sections 6.1, 6.2, 6.3, 6.4, and 6.5

1. Approximate $\sec(12.4^\circ)$ to four decimal places.
- A. 3.5003
- B. 0.0014
- C. 4.6569
- D. 1.0239
- E. None of the above
2. Find the area of the sector of the circle with radius 8.2 cm, whose central angle θ subtends an arc of 12.6 cm. Round your answer to one decimal place.
- A. 51.7 cm^2
- B. 38.5 cm^2
- C. 62.5 cm^2
- D. 42.1 cm^2
- E. None of the above.
3. Which statement is true for the given right triangle?



- A. $\cos \theta = \frac{b}{c}$
- B. $\tan \theta = \frac{b}{\sqrt{c^2 - b^2}}$
- C. $\sin \theta = \frac{\sqrt{c^2 - b^2}}{b}$
- D. $\sec \theta = \frac{\sqrt{c^2 - b^2}}{c}$
- E. $\cot \theta = \frac{c}{b}$

Covers Lessons 1 to 11, Sections 6.1, 6.2, 6.3, 6.4, and 6.5

4. **Stonehenge blocks:** Stonehenge in Salisbury Plains, England, was constructed using solid stone blocks weighing over 97000 pounds each. Lifting a single stone required 550 people, who pulled the stone up a ramp inclined at an angle of 8° . To the nearest foot, approximate the distance that a stone was moved **along the ramp** in order to raise it to a height of 34 feet above the level ground.

- A. 244 *feet*
- B. 402 *feet*
- C. 254 *feet*
- D. 411 *feet*
- E. None of the above.

5. Express the angle θ to the nearest ten-thousandths of a degree.

$$\theta = 274^\circ 53' 6''$$

- A. $\theta = 274.5850^\circ$
- B. $\theta = 274.9833^\circ$
- C. $\theta = 274.8850^\circ$
- D. $\theta = 274.6833^\circ$
- E. None of the above.

6. $\cos(-\alpha)\csc(-\alpha)$ is equivalent to which of the following?

- A. $\cot \alpha$
- B. $-\cot \alpha$
- C. $\tan \alpha$
- D. $-\tan \alpha$
- E. None of the above

Covers Lessons 1 to 11, Sections 6.1, 6.2, 6.3, 6.4, and 6.5

7. Find the exact value of $\tan \theta$ if θ is in standard position and the terminal side of θ is in quadrant *II* and is parallel to the line $5x + 4y = 8$.

A. $\frac{-4}{\sqrt{41}}$

B. $\frac{5}{4}$

C. $\frac{5}{\sqrt{41}}$

D. $\frac{-5}{4}$

E. None of the above.

8. If $\sec \theta = 4$ and $\cot \theta < 0$, find the exact value of $\sin \theta$.

A. $\frac{\sqrt{17}}{8}$

B. $\frac{-1}{4}$

C. $\frac{-\sqrt{17}}{8}$

D. $\frac{1}{4}$

E. None of the above.

Covers Lessons 1 to 11, Sections 6.1, 6.2, 6.3, 6.4, and 6.5

9. Let $P(t) = \left(\frac{-7}{25}, \frac{-24}{25}\right)$ be the point on the unit circle that corresponds to t . Find the exact value of $P(-t + \pi)$.

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

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

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

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

E. None of the above.

10. Complete the statement. As $x \rightarrow \frac{\pi^+}{2}$, $\tan(x) \rightarrow$ _____ .

A. 1

B. ∞ C. $-\infty$

D. undefined

E. None of the above.

11. $\sin^2 \theta (\csc^2 \theta + \sec^2 \theta)$ is equivalent to which of the following?

A. $\sec^2 \theta$

B. $\csc^2 \theta$

C. 1

D. $\cot^2 \theta$

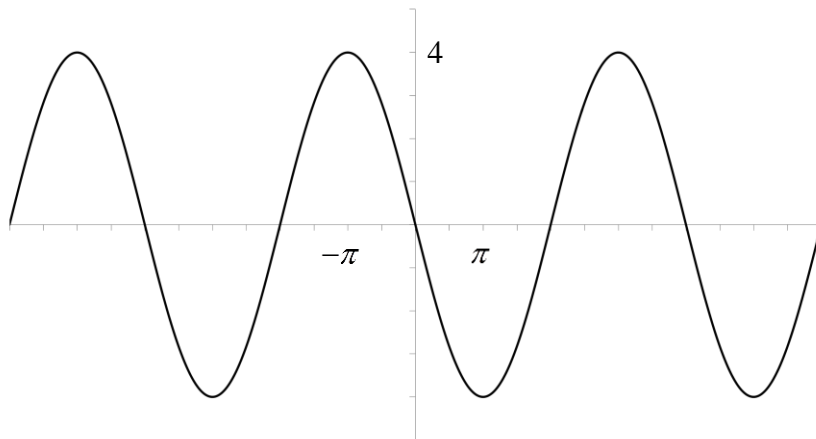
E. $\tan^2 \theta$

Covers Lessons 1 to 11, Sections 6.1, 6.2, 6.3, 6.4, and 6.5

12. What is the y-intercept for the graph of $y = 8\sin\left(2x + \frac{3\pi}{2}\right)$?

- A. $(0, -16)$
- B. $(0, 8)$
- C. $(0, 16)$
- D. $(0, -8)$
- E. None of the above.

13. Find the equation of the graph in the form $y = a \sin(bx + c)$, with $a > 0$, $b > 0$ and least positive real c .



A. $y = 4\sin\left(\frac{1}{2}x + \pi\right)$

C. $y = 4\sin(2x + 2\pi)$

B. $y = 4\sin\left(\frac{1}{2}x + 2\pi\right)$

D. $y = 4\sin(2x + \pi)$

Covers Lessons 1 to 11, Sections 6.1, 6.2, 6.3, 6.4, and 6.5

14. Approximate, to the nearest 0.1° , all angles θ in the interval $[0^\circ, 360^\circ)$ that satisfy the equation $\cos(\theta) = 0.3356$
- A. $70.4^\circ, 289.6^\circ$
 - B. $109.6^\circ, 250.4^\circ$
 - C. $250.4^\circ, 289.6^\circ$
 - D. $70.4^\circ, 109.6^\circ$
 - E. None of the above.
15. Approximate, to the nearest 0.01 **radians**, all angles θ in the interval $[0, 2\pi)$ that satisfy the equation $\cot(\theta) = -1.7401$
- A. 0.35, 3.49
 - B. 2.62, 5.76
 - C. 0.52, 3.66
 - D. 2.79, 5.93
 - E. None of the above.

Exam 1 Answers

	Answers
1.	D
2.	A
3.	B
4.	A
5.	C
6.	B
7.	D
8.	E
9.	B
10.	C
11.	A
12.	D
13.	A
14.	A
15.	B