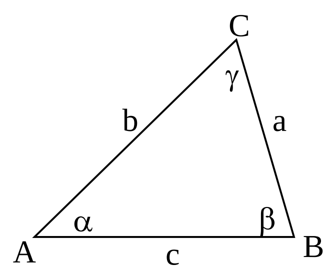
MA 15400
Spring 2014
Exam 1

PYTHAGOREAN IDENTITIES:

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

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

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



MA 15400 Exam 1 Spring 2014

Lessons 1-11, All of Sections 6.1, 6.2, 6.3, 6.4, 6.5.

1. Find the angle that is supplementary to $48°57'9''$

A. $131°2'51''$

B. $41°52'41''$

C. $41°2'51''$

D. $131°52'41''$

E. None of the above

2. Express the angle $153°8'36''$ as a decimal, to the nearest ten-thousandth of an angle.

A. $153.6022°$

B. $153.1433°$

C. $153.4383°$

D. $153.7667°$

E. None of the above

3. If a circular arc of the given length s = 5.2 km subtends the central angle θ = 76° on a circle, find the radius of the circle. Round your answer to the nearest hundredth.

A. $9.95\,km$

B. $3.17\,km$

C. $12.32\,km$

D. $3.92\,km$

E. None of the above

4. A pendulum in a grandfather clock is 5.2 feet long and swings back and forth along a 7-inch arc. Approximate the angle through which the pendulum passes during one swing. Round your answer to the nearest tenth of a degree. (1 foot = 12 inches)

A. 6.4°

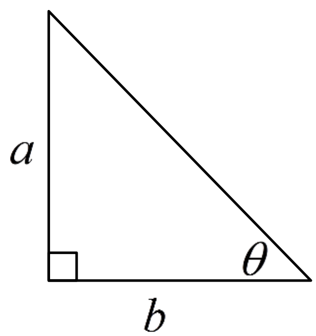
B. 6.6°

C. 6.2°

D. 6.8°

E. None of the above

5. Which one of the following statements is true for the given triangle?



A. $\sec\theta = \dfrac{\sqrt{a^2+b^2}}{a}$

B. $\csc\theta = \dfrac{\sqrt{a^2+b^2}}{b}$

C. $\cos\theta = \dfrac{b}{\sqrt{a^2+b^2}}$

D. $\sin\theta = \dfrac{b}{\sqrt{a^2+b^2}}$

E. More than one of the above answers are correct.

6. Find the quadrant containing θ if $\sec\theta > 0$ and $\tan\theta < 0$.

A. *I*

B. *II*

C. *III*

D. *IV*

E. None of the above

7. Find the exact value of $\sin(\theta)$ if θ is in standard position and the terminal side of θ is in $Q\,IV$ and is parallel to the line through $A(6,2)$ and $B(1,8)$.

A. $\dfrac{-6}{\sqrt{61}}$

B. $\dfrac{5}{\sqrt{61}}$

C. $\dfrac{-5}{\sqrt{61}}$

D. $\dfrac{6}{\sqrt{61}}$

8. Let $P(t)$ be the point on the unit circle U that corresponds to t.
If $P(t)=\left(\dfrac{5}{13},\dfrac{-12}{13}\right)$, find $P(-t+\pi)$

A. $\left(\dfrac{5}{13},\dfrac{-12}{13}\right)$

B. $\left(\dfrac{-5}{13},\dfrac{-12}{13}\right)$

C. $\left(\dfrac{-5}{13},\dfrac{12}{13}\right)$

D. $\left(\dfrac{5}{13},\dfrac{12}{13}\right)$

E. None of the above

9. Find the exact value of $\sec\left(\dfrac{-13\pi}{2}\right)$

A. -2

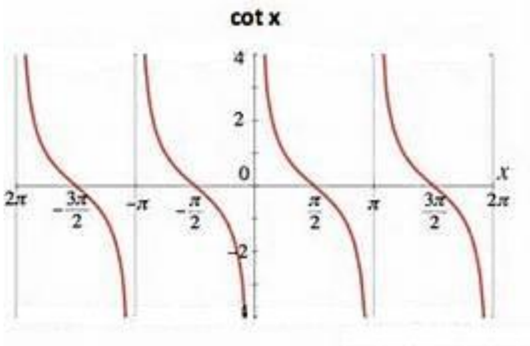
B. 1

C. 0

D. -1

E. None of the above

10. Use the graph to complete the statement: As $x \to \pi^{-}, \cot(x) \to$ ___________



A. $-\infty$

B. 0

C. 1

D. ∞

E. None of the above

11. Find the reference angle θ_R if $\theta = \dfrac{5\pi}{3}$

A. $\theta_R = \dfrac{2\pi}{3}$

B. $\theta_R = \dfrac{-\pi}{3}$

C. $\theta_R = \dfrac{4\pi}{3}$

D. $\theta_R = \dfrac{\pi}{3}$

E. None of the above

12. Find the exact value of $\cos\left(\dfrac{11\pi}{6}\right)$.

A. $\dfrac{-1}{2}$

B. $\dfrac{\sqrt{3}}{2}$

C. $\dfrac{1}{2}$

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

E. None of the above

Lessons 1-11, All of Sections 6.1, 6.2, 6.3, 6.4, 6.5.

13. Approximate, to the nearest 0.1°, all angles θ in the interval [0°, 360°) that satisfy the equation $\sec\theta = 4.5387$.

A. $\theta = 77.3°, 102.7°$

B. $\theta = 12.7°, 167.3°$

C. $\theta = 77.3°, 282.7°$

D. $\theta = 12.7°, 347.3°$

E. None of the above

14. Approximate, to the nearest 0.0001 radians, all angles θ in the interval $[0, 2\pi)$ that satisfy equation $\tan\theta = -1.0383$.

A. $\theta = 2.3374, 3.9458$

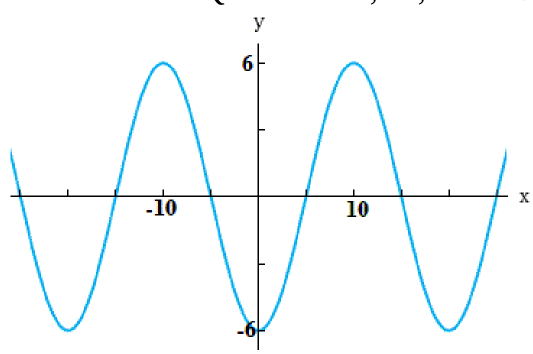
B. $\theta = 0.8042, 3.9458$

C. $\theta = 0.8042, 5.4790$

D. $\theta = 2.3374, 5.4790$

E. None of the above

Use the graph of the **sine** function to answer Questions 15, 16, and 17.



15. Find the amplitude

A. 6

B. –12

C. 12

D. –6

16. Find the period

A. 10

B. 15

C. 20

D. 5

17. Find the Phase Shift

A. –5

B. –15

C. –10

D. –20

Lessons 1-11, All of Sections 6.1, 6.2, 6.3, 6.4, 6.5.

Question	Answers	
1.	A	$131°2'51''$
2.	B	$153.1433°$
3.	D	$3.92\,km$
4.	A	$6.4°$
5.	C	$\cos\theta = \frac{b}{\sqrt{a^2+b^2}}$
6.	D	IV
7.	A	$\frac{-6}{\sqrt{61}}$
8.	B	$\left(\frac{-5}{13}, \frac{-12}{13}\right)$
9.	E	Undefined
10.	A	$-\infty$
11.	D	$\theta_R = \frac{\pi}{3}$
12.	B	$\frac{\sqrt{3}}{2}$
13.	C	$\theta = 77.3°, 282.7°$
14.	D	$\theta = 2.3374, 5.4790$
15.	A	6
16.	C	20
17.	B	-15