MA 15400

Spring 2013

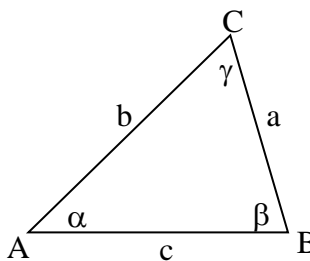# Exam 1

PYTHAGOREAN IDENTITIES:

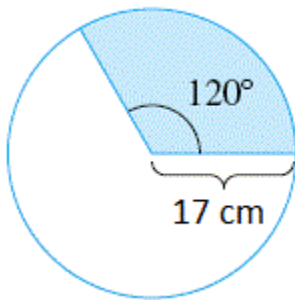$\sin^2 \theta + \cos^2 \theta = 1$

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

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

1. Express $\theta = 3.25$ radians in terms of degrees, minutes, and seconds, to the nearest second.

    A. 186° 21' 13"

    B. 186° 12' 41"

    C. 186° 13' 41"

    D. 186° 13' 40"

    E. None of the above

2. Find the length of the arc of the colored sector. Round to the nearest tenth.

    A. 35.6 *cm*

    B. 41.2 *cm*

    C. 39.8 *cm*

    D. 45.6 *cm*

    E. None of the above

120°

17 cm

3. Find the perimeter of triangle ABC with $\gamma = 90°$, $\beta = 51°$, and side $a = 5$.
    Round to one decimal place.

    A. 22.9

    B. 15.5

    C. 18.6

    D. 19.1

    E. None of the above

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Lessons 1-12, Sections 6.1, 6.2, 6.3, 6.4, 6.5, and 6.7 up to questions #31

4. Find the exact value of csc(θ) if θ is in standard position and the terminal side of θ is in quadrant IV and on the line $2x + 7y = 0$.

A. $\csc(\theta) = \dfrac{-\sqrt{53}}{7}$

B. $\csc(\theta) = \dfrac{\sqrt{53}}{7}$

C. $\csc(\theta) = \dfrac{-\sqrt{53}}{2}$

D. $\csc(\theta) = \dfrac{\sqrt{53}}{2}$

E. None of the above

5. Find the quadrant containing θ if the given conditions are true.

$\cos(\theta) > 0$ and $\sin(\theta) < 0$

A. *QI*

B. *QII*

C. *QIII*

D. *QIV*

2

6. Let P be the point that corresponds to the intersection of the terminal side of angle t and the unit circle. Find $\cos(t)$ if $t = \dfrac{17\pi}{3}$.

    A. $\cos(t) = \dfrac{1}{2}$

    B. $\cos(t) = \dfrac{\sqrt{3}}{2}$

    C. $\cos(t) = \dfrac{-1}{2}$

    D. $\cos(t) = \dfrac{-\sqrt{3}}{2}$

    E. None of the above

7. Let P be the point that corresponds to the intersection of the terminal side of angle t and the unit circle. If $P(t) = \left(\dfrac{-15}{17}, \dfrac{8}{17}\right)$ find $P(-t + \pi)$.

    A. $\left(\dfrac{-15}{17}, \dfrac{-8}{17}\right)$

    B. $\left(\dfrac{15}{17}, \dfrac{-8}{17}\right)$

    C. $\left(\dfrac{-15}{17}, \dfrac{8}{17}\right)$

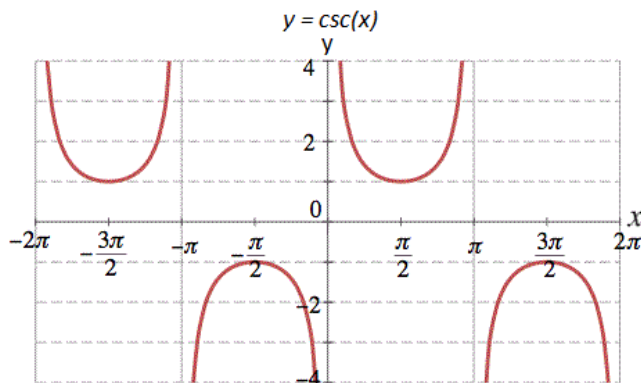   D. $\left(\dfrac{15}{17}, \dfrac{8}{17}\right)$

    E. None of the above

8.   Which of the following is equivalent to $\dfrac{\cot x + \tan x}{\cot x}$?

A. $\sin^2 x$

B. $\cos^2 x$

C. $\sec^2 x$

D. $\csc^2 x$

E. 1

9.   using the graph of the csc(x) function, complete the following

$As\ x \to 0^+, \csc(x) \to$ _____

$y = csc(x)$

A. ∞

B. -1

C. $-\infty$

D. 1

E. Undefined

10. Find the reference angle, θ_R, if $\theta = 52.1$. Round your answer to the nearest 0.01 radian.

A. 1.41

B. 1.31

C. 1.21

D. 1.51

E. None of the above

11. Approximate, to the nearest 0.1°, all angles θ in the interval [0°, 360°) that satisfy the equation $\cot \theta = 2.3456$

       A. $16.1°, 196.1°$

       B. $156.9°, 336.9°$

       C. $23.1°, 203.1°$

       D. $163.9°, 343.9°$

       E.   None of the above

12. Approximate, to the nearest 0.01 radian, all angles θ in the interval [0, 2π) that satisfy the equation $\sin \theta = -0.8765$.
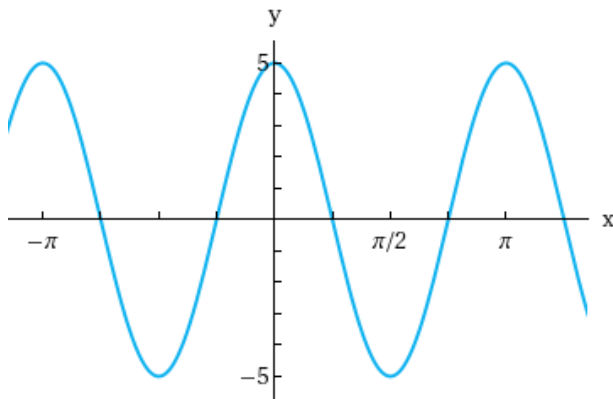
       A. $4.21, 5.21$

       B. $2.07, 4.21$

       C. $4.55, 4.87$

       D. $1.73, 4.55$

       E.   None of the above

13.   Find the period and the phase shift $y = 5\sin\left(2x - \dfrac{\pi}{3}\right)$

       A.   *Period* $= 2\pi$, *Phase Shift* $= \dfrac{\pi}{6}$

       B.   *Period* $= 4\pi$, *Phase Shift* $= 2\pi$

       C.   *Period* $= 2\pi$, *Phase Shift* $= -2\pi$

       D.   *Period* $= 4\pi$, *Phase Shift* $= \dfrac{-\pi}{6}$

       E.   None of the above

14. Write the equation in the form $y = a\,\sin(bx + c)$ for $a > 0$, $b > 0$, and the least positive real number c.

A. $y = 5\sin\left(\dfrac{1}{2}x + \pi\right)$

B. $y = 5\sin\left(2x + \dfrac{\pi}{2}\right)$

C. $y = 5\sin\left(\dfrac{1}{2}x + \dfrac{\pi}{2}\right)$

D. $y = 5\sin\left(2x + \pi\right)$

15. From a point 135 meters above level ground, a surveyor measures the **angle of depression** of an object on the ground at $61°$. Approximate the distance from the object to the point on the ground directly beneath the surveyor. Round your answer to the nearest meter.
[Warning: Check the mode on your calculator!]

A. 80 *meters*

B. 244 *meters*

C. 262 *meters*

D. 75 *meters*

E. None of the above

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