Precalculus Name _____

I. Multiple Choice

C 1. If $\sin\theta < 0$ and $\tan\theta > 0$, then in which quadrant does $\theta$ lie?

(A) I (B) II (C) III (D) IV

C 2. Given an angle of 230˚, its reference angle is:

(A) 130˚ (B) 40˚ (C) 50˚ (D) 30˚ (E) None of these

B 3. The domain of y = sin (x) is:

(A) $-90^\circ \le x \le 90^\circ$ (B) $-\infty < x < +\infty$ (C) $-1 \le y \le 1$
(D) $0 \le y \le 180^\circ$ (E) None of these

C 4. The range of y = cos (x) is:

(A) $-90^\circ \le x \le 90^\circ$ (B) $-\infty < x < +\infty$ (C) $-1 \le y \le 1$
(D) $0 \le y \le 180^\circ$ (E) None of these

C 5. The exact value of $\csc\left(\frac{5\pi}{3}\right)$ is

(A) $\frac{-\sqrt{3}}{2}$ (B) $\frac{2\sqrt{3}}{3}$ (C) $-\frac{2\sqrt{3}}{3}$ (D) 2 (E) None of these

D 6. Given that $\sin\theta = -\frac{1}{5}$ and $\tan\theta < 0$, determine the value of $\cos\theta$.

(A) $-\frac{\sqrt{26}}{5}$ (B) $\frac{\sqrt{26}}{5}$ (C) $-\frac{2\sqrt{6}}{5}$ (D) $\frac{2\sqrt{6}}{5}$ (E) None of these

A 7. Determine the exact value of $\sin\left(\frac{7\pi}{6}\right)$

(A) $-\frac{1}{2}$ (B) $-\frac{\sqrt{3}}{2}$ (C) $\frac{\sqrt{3}}{2}$ (D) $\frac{\sqrt{2}}{2}$ (E) None of these

C 8. Determine the amplitude of $y = 3\sin(2x) + 4$

(A) 1 (B) 2 (C) 3 (D) 4 (E) None of these

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Convert from degrees to radians.

1) $210°$ $= 180° + 30° = \pi + \frac{\pi}{6}$ 1) C

A) $\frac{7\pi}{12}$ B) $\frac{7\pi}{3}$ C) $\frac{7\pi}{6}$ D) $\frac{7\pi}{5}$

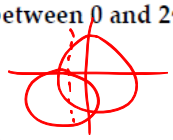
Convert the radian measure to degree measure. Use the value of $\pi$ found on a calculator and round answers to two decimal places.

2) $\pi/2$ $= 90°$ 2) D

A) $1.57°$ B) $(\pi/2)°$ C) $90\pi°$ D) $90°$

Find the value of the unique real number $\theta$ between 0 and $2\pi$ that satisfies the given conditions.

4) $\cos\theta = -\frac{\sqrt{2}}{2}$ and $\tan\theta > 0$ 4) B



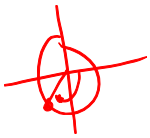
A) $\frac{3\pi}{4}$ B) $\frac{5\pi}{4}$ C) $\frac{2\pi}{3}$ D) $\frac{\pi}{4}$

Evaluate without using a calculator by using ratios in a reference triangle.

5) $\sec 240° = \frac{1}{\cos 240°} = \frac{1}{-\frac{1}{2}} = -2$ 5) A

A) $-2$ B) $-\frac{2\sqrt{3}}{3}$ C) $2$ D) $\frac{2\sqrt{3}}{3}$

6) $\tan\left(-\frac{2\pi}{3}\right) = \frac{\sin\left(-\frac{2\pi}{3}\right)}{\cos\left(-\frac{2\pi}{3}\right)} = \frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}}$ 6) A



A) $\sqrt{3}$ B) $\frac{\sqrt{3}}{3}$ C) $-\frac{\sqrt{3}}{3}$ D) $-\sqrt{3}$

Point P is on the terminal side of $\theta$. Evaluate the six trigonometric functions for $\theta$. If the function is undefined, write "undefined."

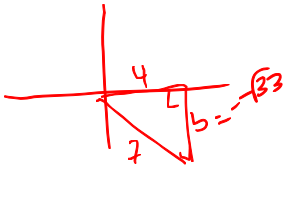
7) P(12, 16); find $\csc\theta$. $= \frac{1}{\sin\theta} = \frac{20}{16} = \frac{5}{4}$ 7) D

A) $\frac{3}{4}$ B) $\frac{4}{3}$ C) $\frac{5}{3}$ D) $\frac{5}{4}$

Evaluate without using a calculator.

8) $\sin\theta$, if $\cos\theta = \frac{4}{7}$ and $\tan\theta < 0$ Q4 8) B

A) $-\frac{7}{4}$ B) $-\frac{\sqrt{33}}{7}$ C) $-\sqrt{33}$ D) $-\frac{\sqrt{33}}{4}$



**Evaluate the trigonometric function of the given quadrantal angle. If the value is undefined, write "undefined."**

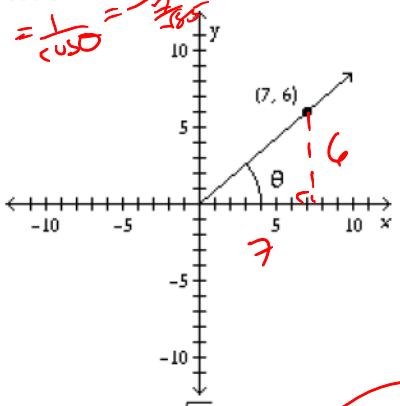
9) cos 3π

A) -1 B) 1 C) undefined D) 0

9) A

**Find the trigonometric function value for the angle shown.**

10) sec θ




A) $\sec\theta = \frac{7\sqrt{85}}{85}$ B) $\sec\theta = \frac{\sqrt{85}}{7}$ C) $\sec\theta = \frac{7}{6}$ D) $\sec\theta = \frac{6}{7}$

10) B

**Decide whether a triangle can be formed with the given side lengths. If so, use Heron's formula to find the area of the triangle.**

11) a = 240, b = 129 , c = 175

A) 6326.96 B) 10,987.87

C) No triangle is formed. D) 6312.86

11) _____

**Solve the problem.**

12) The minute hand of a clock is 13 inches long. What distance does its tip move in 28 minutes?

A) $\frac{91}{15}\pi$ in. B) $\frac{14}{195}\pi$ in. C) $\frac{182}{15}\pi$ in. D) $\frac{7}{195}\pi$ in.

12) _____

**State whether the given measurements determine zero, one, or two triangles.**

13) A = 53°, a = 23, b = 28

A) One B) Zero C) Two

13) C

14) C = 30°, a = 34, c = 17

A) Two B) One C) Zero

14) B

**Solve the triangle.**

15) A = 42°, B = 30°, b = 8

A) C = 108°, a ≈ 6, c ≈ 15.3

B) C = 108°, a ≈ 6, c ≈ 11.4

C) C = 108°, a ≈ 10.7, c ≈ 15.3

D) C = 18°, a ≈ 6, c ≈ 11.4

15) C

B 59. Find the period of $y = -4\cot(2x)$ $\frac{\pi}{2}$

(A) $\pi$ (B) $\frac{\pi}{2}$ (C) $2\pi$ (D) $\frac{\pi}{4}$ (E) None of these

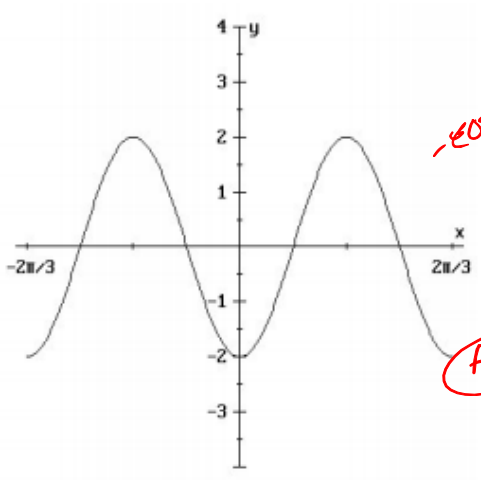
D 60. Simplify the expression $\frac{1}{\cos^2\theta} - 1$ completely. The result is $\frac{1-\cos^2\theta}{\cos^2\theta} = \frac{\sin^2\theta}{\cos^2\theta} = \tan^2\theta$

(A) $\cot^2\theta$ (B) $\sec^2\theta$ (C) 0 (D) $\tan^2\theta$ (E) None of these

B 61. Simplify $\frac{\sec x}{\csc x}$ completely. $= \frac{\frac{1}{\cos x}}{\frac{1}{\sin x}} = \frac{\sin x}{\cos x} = \tan x.$

(A) 1 (B) $\tan x$ (C) $\tan^3 x$ (D) $\cot x$ (E) $\cot^2 x$

A 63. Which of the following could be the equation of the function $g(x)$ graphed below?




-cos

A=2

$\frac{2\pi}{B} = \frac{2\pi}{3}$

B=3

$g(x) = -2\cos(3x)$

(A) $g(x) = -2\cos(3x)$ (B) $g(x) = -2\sin(3x)$ (C) $g(x) = -2\cos\left(\frac{x}{3}\right)$

(D) $g(x) = -2\sin\left(\frac{x}{3}\right)$ (E) $g(x) = 2\sin(3x)$

D 69. Let $\theta$ be an angle in standard position. The terminal side of $\theta$ intersects the unit circle at $\left(-\frac{2}{5}, \frac{\sqrt{21}}{5}\right)$. Find $\cot\theta$. $= \frac{\cos\theta}{\sin\theta} = \frac{x}{y} = \frac{-\frac{2}{5}}{\frac{\sqrt{21}}{5}} = -\frac{2}{\sqrt{21}}$

(A) $\sqrt{21}$ (B) $\frac{\sqrt{21}}{5}$ (C) $-\frac{1}{5}$ (D) $-\frac{2}{\sqrt{21}}$ (E) $-\sqrt{21}$