Math 110 Common Exam #2
October 23, 2024

Time: 1 hour and 25 minutes

Instructions: Show all work for full credit.
No outside materials or calculators allowed.

Extra Space: Use the backs of each sheet
for extra space. Clearly label when doing so.

Name: _____

ID #: _____

Instructor/Section: _____

*"I pledge by my honor that I have abided by the
NJIT Academic Integrity Code."*

_____ (Signature)

Problem		Score
1		
2		
3		
4		
5		
6		
7		
8		

1. Find the exact value of the following expressions: (5 pts each)

    a. $csc45° - sec45°$

    b. $sin^2\left(74.5° + \frac{\pi}{12}rad\right) + cos^2\left(74.5° + \frac{\pi}{12}rad\right)$

    c. $sin\left[sin^{-1}\left(-\frac{3}{5}\right) - cos^{-1}\left(\frac{4}{5}\right)\right]$

    d. $tan(690°)$

2. Television screens are measured by the length of the diagonal of the screen. Find the width of a 19-inch television screen if the diagonal makes an angle of 60° with the base of the screen. (8 pts)

3. Verify the following identities: (6 pts each)

    a. $sinxcosx(tanx + cotx) = 1$

    b. $\dfrac{9-16sin^2x}{3+4sinx} = 3 - 4sinx$

4. True or False (no work required) (3 pts each)

    a. All six trig functions are negative in quadrant 3.

    b. The inverse of $tan\theta$ is $cot\theta$

    c. $sin\left(\dfrac{\pi}{2} - x\right) = cosx$
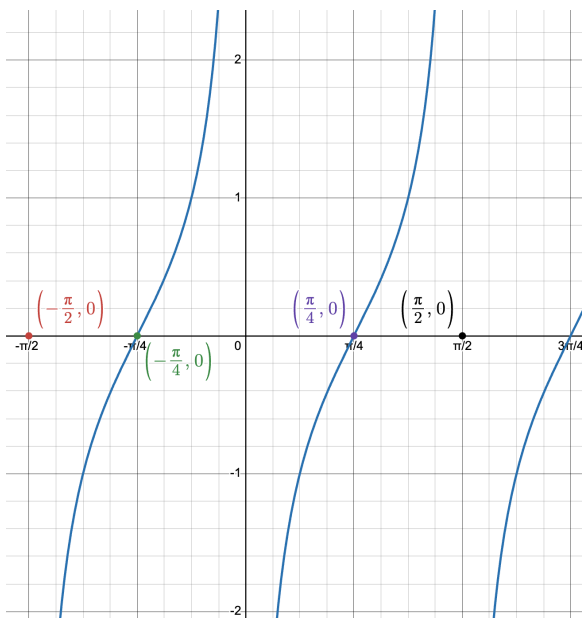
    d. $cos^{-1}\left(cos\left(\dfrac{5\pi}{4}\right)\right) = \dfrac{3\pi}{4}$

5. Graph at least one period of the following functions. Be sure to label at least TWO identifying points and any appropriate asymptotes. (8 pts each)

    a. $y = 3\cos\left(\frac{3\pi x}{2}\right)$

    b. $y = -4\csc\left(3x - \frac{\pi}{2}\right)$

6. Consider the graph below, and find an equation for it in the form of tangent. (8 pts)

7. Consider the function $y = 2sinx + 1$

   a. State the domain and range of the function. (4 pts)

   b. Find the inverse of the function. (6 pts)

   c. State the domain and range of the inverse function. (4 pts)

8. Below are quadrants 3 and 4 of the unit circle. Label all special angles and axes with the appropriate degrees, radians, and coordinates. (10 pts)