MATH 30 - Precalculus, Sec. 2495

Third test. Time allowed: two hours.   Professor Luis Fernández

NAME:_____

[8] **1.** Write the **exact value (NO decimals)** of

  a) $\log_{25} 5 =$

  b) $\log_7 \sqrt[3]{7} =$

  c) $87^{\log_{87} 12} =$

  d) $\log_{13} 13^{41} =$

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[12] **2.** Write the **exact value (NO decimals)** of

  a) $\tan\left(\dfrac{5\pi}{3}\right) =$

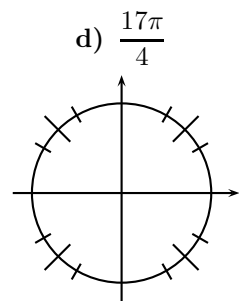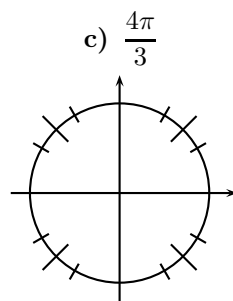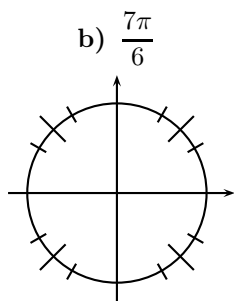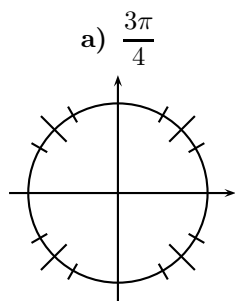 **b)** $\cos\left(\dfrac{\pi}{6}\right) =$

  c) $\sin\left(\dfrac{\pi}{4} - 20\pi\right) =$
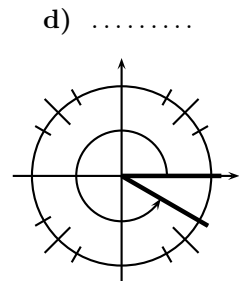
  d) $\sin\left(\dfrac{5\pi}{6}\right) =$
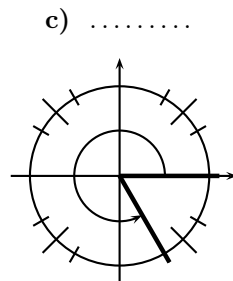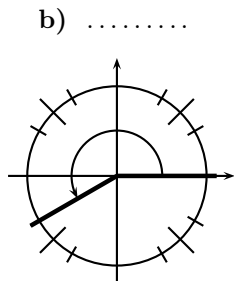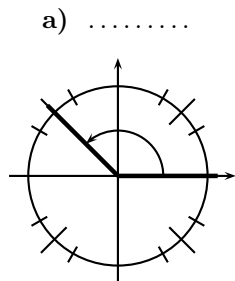
  e) $\sin\left(-\dfrac{\pi}{3}\right) =$

  f) $\cos\left(\dfrac{3\pi}{4} + 15\pi\right) =$

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[10] **3.** Draw the following angles in standard position in the circles provided.

  a) $\dfrac{3\pi}{4}$

  b) $\dfrac{7\pi}{6}$

  c) $\dfrac{4\pi}{3}$

  d) $\dfrac{17\pi}{4}$

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[10] **4.** Write, in the space provided, the value IN RADIANS of the angles given in the following pictures.

  a) ....

  b) ....

  c) ....

  d) ....

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[4] **5.** Condense the following logarithmic expressions (that is, write them using only one logarithm in the front).

  a) $7\log y + 2\log x =$

  b) $\frac{1}{4}\log x - 3\log y =$

[4] **6.** Expand the following logarithmic expressions (that is, write them using addition and subtraction of many logarithms).

a) $\log_5 \left(\dfrac{x^5}{14} \right) =$

b) $\log_7 \left(\sqrt{x^2 + 3} \right) =$

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[18] **7.** Solve the following inequalities.

a) $x^3 - 2x^2 - x + 2 > 0$

b) $\dfrac{(x+4)(x-2)}{x(x+2)} \geq 0$

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[8] **8.** Find the inverse of the function $f(x) = 3^{2x-5}$. What is the domain of the inverse?

[16] **9.** Solve **TWO** of the following three equations. If necessary, leave the answer expressed in terms of logarithms (you do not need to use the calculator).

a) $3^{3x-1} = 81$

b) $\log_4(x) + \log_4(x - 15) = 2$

c) $\operatorname{Ln}(3x - 1) - \operatorname{Ln}(7x - 3) = \operatorname{Ln} 2$

[5] **10.** Given that $\tan x = -\dfrac{4}{3}$, and that x lies in the second quadrant, find

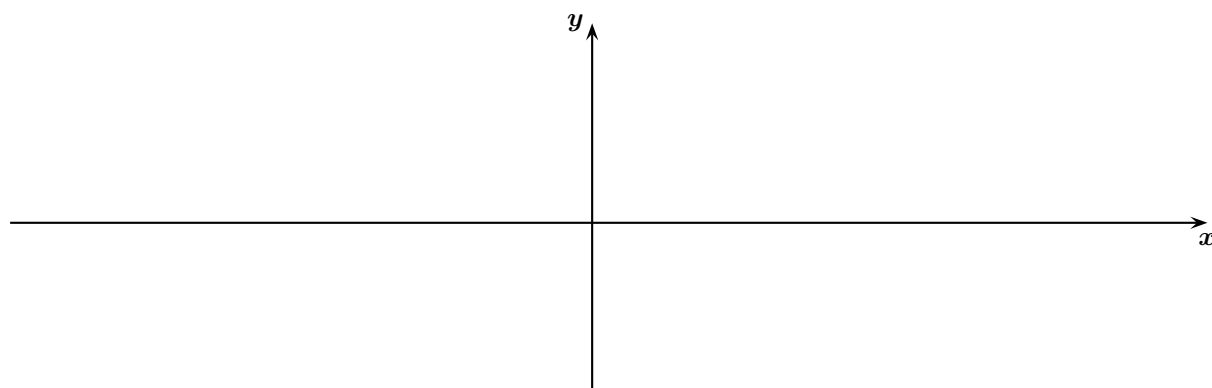**a)** $\sin x =$ **b)** $\cos x =$ **c)** $\sec x =$ **d)** $\cot x =$ **e)** $\csc x =$

[18] **11.** Find the amplitude, the period and the phase shift, and graph **one** cycles of the following functions in the axes provided.

a) $f(x) = 2 \sin \left(x + \dfrac{\pi}{2} \right)$

b) $g(x) = 2 \cos \left(3x - \dfrac{\pi}{2} \right)$