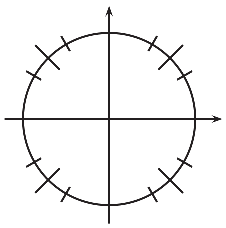
MATH 30 - Precalculus, Sec. 2503

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

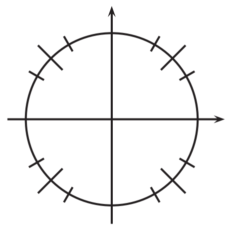
NAME:____

[8] **1.** Draw the following angles in standard position in the circles provided.

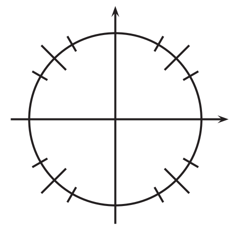
a) $\frac{7\pi}{4}$



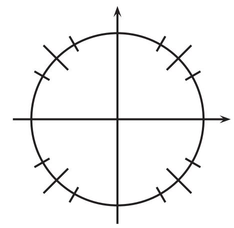
b) $\frac{7\pi}{6}$



c) $\frac{5\pi}{3}$



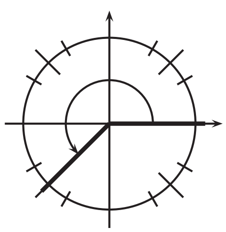
d) $\frac{11\pi}{4}$



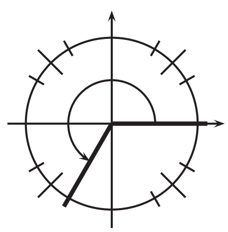
---

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

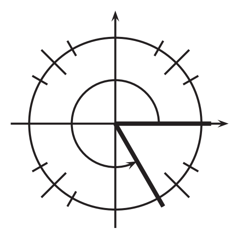
a) ....



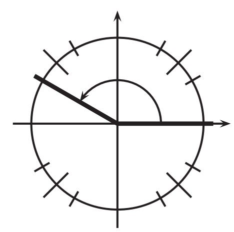
b) ....



c) ....



d) ....



---

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

a) $\log_3 81 =$

b) $\log_5 \sqrt[4]{5} =$

c) $1023^{\log_{1023} 5} =$

d) $\log_{4513} 4513^{13} =$

---

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

a) $\sin\left(\frac{\pi}{4}\right) =$

b) $\cos\left(\frac{\pi}{3} - 20\pi\right) =$

c) $\tan\left(\frac{\pi}{4}\right) =$

d) $\sin\left(\frac{4\pi}{3}\right) =$

e) $\sin\left(\frac{7\pi}{6}\right) =$

f) $\cos\left(-\frac{3\pi}{4} + 5\pi\right) =$

---

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

a) $12\log a - 2\log b + 5\log c =$

b) $\frac{\log x}{7} - \frac{3}{5}\log y =$

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

a) $\log_8\left(\frac{x^{12}}{7}\right) =$

b) $\log_5\left(\sqrt{2x^2+y}\right) =$

---

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

a) $\frac{x^2+x-6}{x+1} \leq 0$

b) $x^3 - 4x^2 + 5x \geq 2$

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

a) $7^{2x-1} = 5$

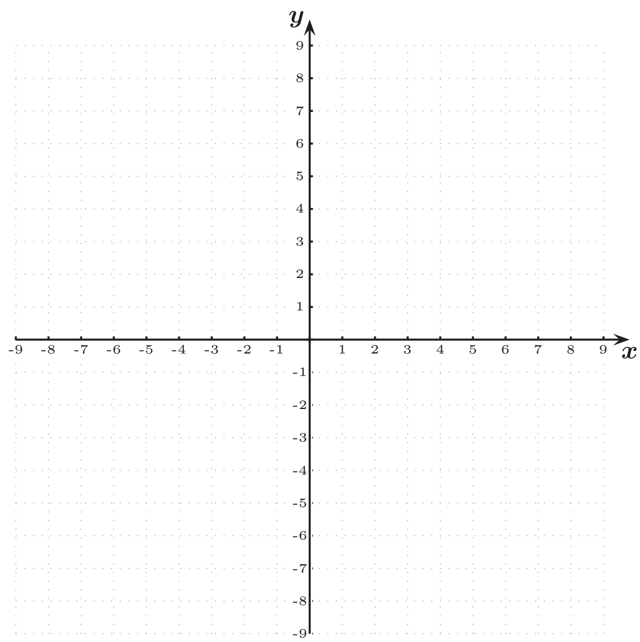
b) $\log_4(x) + \log_4(x-6) = 2$

c) $\log(3x-1) - \log(2x-3) = \log 2$

[15] **9.** Let $f(x) = 2^{x-1}$ and $g(x) = 1 + \log_2 x$.

a) Show that f and g are inverses of each other.

b) Graph f and g in the coordinate axes below.



---

[11] **10.** Given that $\tan x = -\dfrac{6}{7}$, and that x lies in the second quadrant, find

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