

**Practice Test 2. June 27, 2007.**

**Math 0115 Sec 0101 Summer 2007**

*You may not use a calculator for this test.*

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[25] 1. Let  $f(x) = \frac{(4x - 4)(x + 2)^3}{(x - 6)^2(2x + 1)^2}$

- (A) Find the  $y$ -intercept, if any.
  - (B) Find the  $x$ -intercepts, if any.
  - (C) Find the vertical asymptotes, if any.
  - (D) Find the horizontal asymptotes, if any.
  - (E) Using the information from (A)-(D), sketch the graph of  $f(x)$ .
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[15] 2. On the same set of axes, sketch and label the graph of:

$$\begin{aligned} f(x) &= 2^x \\ g(x) &= 5^{-x} \\ h(x) &= 5^{-x} + 1 \\ i(x) &= \ln(x) \\ j(x) &= \ln(x - 1) \\ k(x) &= \log_2(-x) \end{aligned}$$

Your graph doesn't have to be perfect, but you must label the asymptotes, if any, and make sure that your points for the small values are accurate on the grid.

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[10] 3. Find all solutions to the exponential equation:  $e^{2x-3} = 1$

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[10] 4. Find all solutions to the logarithmic equation:  $\log_5(x^2) = 2\log_5(x) - \log_5(x - 5) + 1$ . Be sure to check your answers.

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[10] 5. Suppose that the point  $P = (x, \frac{4}{5})$  is on the unit circle. (A) What are all of the possible values for  $x$ ? (B) Suppose you are given that  $P$  is in Quadrant II. What must  $x$  be?

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[10] 6. Find the following values:

(A)  $\tan \frac{\pi}{6}$       (B)  $\sin \frac{3\pi}{2}$       (C)  $\csc \frac{-\pi}{3}$       (D)  $\cot \frac{-5\pi}{6}$       (E)  $\sec \frac{\pi}{3}$

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[10] 7. Given that the terminal point of  $t$  is in Quadrant IV and  $\tan t = -\sqrt{3}$ , find  $\cos t$ . *Hint:* it may be easier to figure out  $\sec t$  first.

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[10] 8. Let  $f(x) = 2\cos(2x) + 2$ . (A) What are the period and amplitude of  $f(x)$ ? (B) What phase shift is applied, if any? (C) Sketch the graph of both  $f(x)$  and  $y = \cos x$  on the same axes.

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