Math 114
Midterm 3 Part 1
Wed Mar 11, 2009

Name: _____

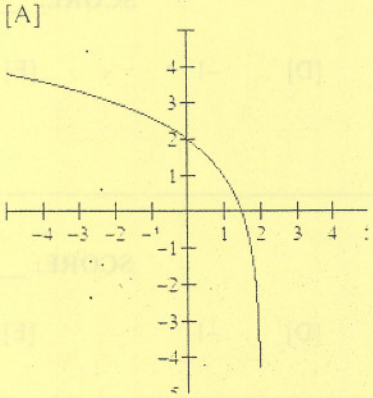
NO CALCULATORS ALLOWED

[1] **WRITE THE LETTER OF THE CORRECT ANSWER IN THE SPACE PROVIDED**
DO *NOT* CIRCLE THE ANSWERS

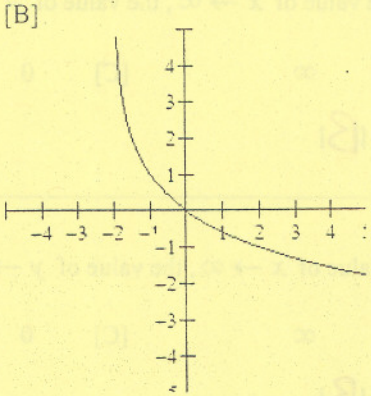
The graph of $f(x) = \log_2(-(x-2)) - 1$ is

SCORE: ___ / 6 POINTS

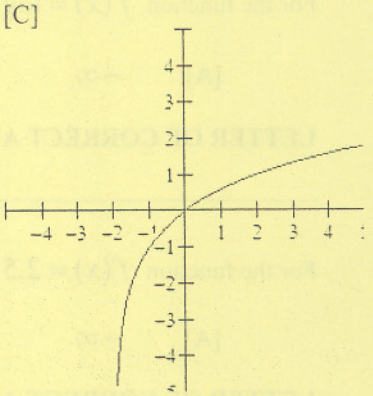
[A]



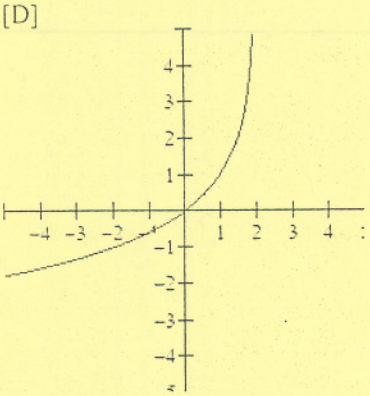
[B]



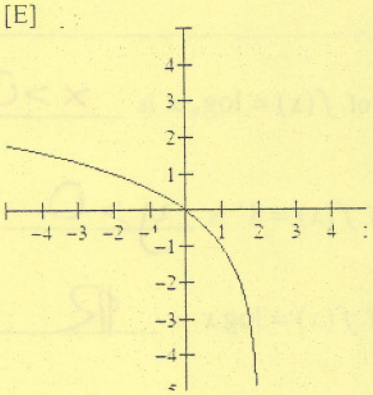
[C]



[D]



[E]



LETTER OF CORRECT ANSWER: [E]

For the function $f(x) = \left(\frac{2}{5}\right)^x$, as the value of $x \to \infty$, the value of $y \to$

SCORE: ___ / 3 POINTS

[A] $-\infty$ [B] ∞ [C] 0 [D] -1 [E] 1

LETTER OF CORRECT ANSWER: [C]

The graph of $f(x) = -5^{x-2} + 4$ has an asymptote at

SCORE: ___ / 3 POINTS

[A] $x = 4$ [B] $x = -4$ [C] $y = 2$ [D] $y = 4$ [E] $x = -2$

LETTER OF CORRECT ANSWER: [D]

For the function $f(x) = \log_7 x$, as the value of $x \to 0$, the value of $y \to$ SCORE: ___ / 3 POINTS

[A] $-\infty$ [B] ∞ [C] 0 [D] -1 [E] 1

LETTER OF CORRECT ANSWER: [A]

The graph of $f(x) = -\log_4(x-3)+6$ has an asymptote at SCORE: ___ / 3 POINTS

[A] $x = 6$ [B] $x = -6$ [C] $x = 3$ [D] $y = -3$ [E] $y = 6$

LETTER OF CORRECT ANSWER: [C]

For the function $f(x) = \log_3 x$, as the value of $x \to \infty$, the value of $y \to$ SCORE: ___ / 3 POINTS

[A] $-\infty$ [B] ∞ [C] 0 [D] -1 [E] 1

LETTER OF CORRECT ANSWER: [B]

For the function $f(x) = 2.5^x$, as the value of $x \to \infty$, the value of $y \to$ SCORE: ___ / 3 POINTS

[A] $-\infty$ [B] ∞ [C] 0 [D] -1 [E] 1

LETTER OF CORRECT ANSWER: [B]

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[2] [a] The domain of $f(x) = \log_9 x$ is $x > 0$. SCORE: ___ / 3 POINTS

[b] The range of $f(x) = 8^x$ is $y > 0$. SCORE: ___ / 3 POINTS

[c] The range of $f(x) = \log x$ is $\mathbb{R}$. SCORE: ___ / 3 POINTS

[d] The domain of $f(x) = 9^x$ is $\mathbb{R}$. SCORE: ___ / 3 POINTS

[3] Evaluate the following. Write "UNDEFINED" if the value does not exist. SCORE: ___ / 30 POINTS

[a] $\log_4 64 = 3$

[b] $\log 10000 = 4$

[c] $\log_3 3^{-4} = -4$

[d] $10^{\log 8} = 8$

[e] $\log_{16} 4 = \frac{1}{2}$

[f] $\log_3 \frac{1}{9} = -2$

[g] $\log_7 7^6 = 6$

[h] $6^{\log_6 0} =$ UNDEFINED

[i] $\log_5(-25) =$ UNDEFINED

[j] $\log_9 1 = 0$

YOU MUST SHOW LOGICAL, NEAT AND ORGANIZED WORK TO EARN FULL CREDIT

PUT A BOX AROUND YOUR FINAL ANSWER

[4] Write $\log z - 2\log x + 3\log y$ as the logarithm of a single expression. SCORE: ___ / 5 POINTS

$\log \frac{zy^3}{x^2}$

[5] Write $\log \frac{z^4}{\sqrt[3]{xy}}$ as the sums / differences / multiples of logarithms of numbers or single variables. SCORE: ___ / 5 POINTS

$4\log z - \frac{1}{3}\log x - \frac{1}{3}\log y$

[6] Find the exact solutions of the following equations algebraically. **Check your answers.** SCORE: ___ / 18 POINTS

[a] $8^{2x+6} = 4^{1-x}$

SEE WHITE KEY

[b] $\log_2(x^2-9) - \log_2(x-2) = 3$

SEE WHITE KEY

TO BE CONTINUED DURING THE FIRST 15 MINUTES OF LAB TOMORROW