Exam 3

Name: Date: June 13, 2013

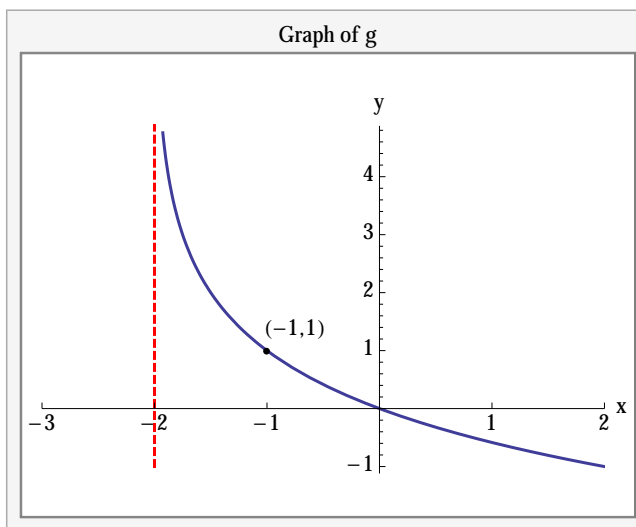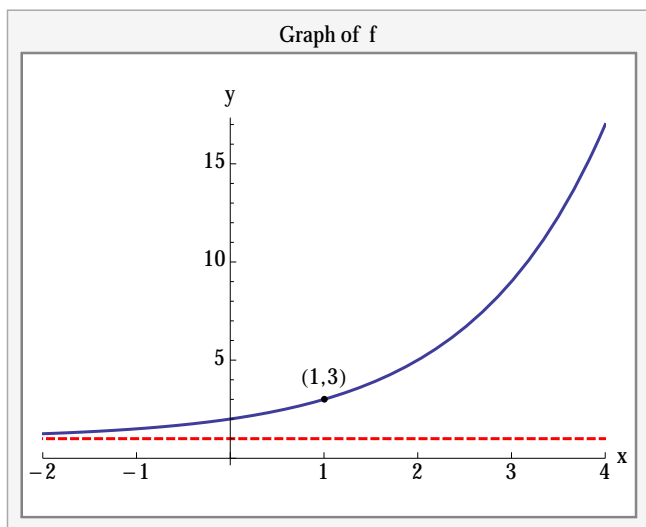**P 1.**   [10 points] State the formula or logarithmic property.

(a) Change-of-base formula

(b) Power Property

(c) Quotient Property

(d) Product Property

(e) Inverse Property

P 2. [12 Points] Consider the graphs of f and g below.

Graph of f

Graph of g

Use the graphs to answer the following. If a solution does not exist, state why.

(a) Determine the asymptotes of f.

(b) Determine the asymptotes of g.

(c) Find the y-intercept of f (if any).

(d) Assume $f(x) = A2^{Kx} + D$. Find the constants A, K, and D.

(e) Assume $g(x) = A\log_2(Kx + 1) + D$. Find the constants A, K, and D.

(f) Determine $\dfrac{f(0) + g(-1)}{2}$.

P 3. [4 points] Solve
$$3e^{2x-1} - 1 = 0$$

P 4. [8 points] Solve
$$e^{2x} + e^x - 12 = 0$$

P 5. [6 points] Solve
$$5\ln(3x+1) - 4 = 0.$$

P 6. [12 points] Solve
$$\log_6(x+2) - \log_6 x = \log_6(x+5)$$

P 7. [10 points] Graph
$$g(x) = 2e^{5x+3} - 4.$$

Find and label the x and y-intercepts, and asymptotes (if any). Also include a table of "nice" values where to evaluate g and the corresponding values of g.

P 8. [10 points] Graph

$$f(x) = -4\log_2(-x + 3) + 5.$$

Find and label the x and y-intercepts, and asymptotes (if any). Also include a table of "nice" values where to evaluate f and the corresponding values of f.

P 9. [8 points] Expand

$$\log_4 \left(\frac{x^2}{y^3 \sqrt{x-1}} \right),$$

where $x > 1$ and $y > 0$.

P 10. [8 points] Condense

$$\frac{1}{3} \left[\log_3(x-2) + 4\log_3(x+2) \right] - 6\log_3 x$$

P 11. [12 points] Simplify as much as possible.

(a) $\log_3 81^{-3} + \ln 1$

(d) $\log_3(-27)$

(b) $\ln \frac{6}{e^2}$

(e) $\log_2 \sqrt[4]{8}$

(c) $2 \ln e^6 - \ln e^5$

(f) $\log_5 \frac{1}{125}$