Review Test #3
Chapters 3 & 5 (5.4, 5.5, 5.6)

To prepare for the test, study the following exercises:

Handout 4.2   Exercises # 1, 2, 3, 4, 7, 8, 9, 10

Handout 4.5 & 4.6   Exercises # 2 – 28 even

Handout 5.6   Example 2, Exercises # 1, 2

Textbook Section 5.4   Exercises # 1, 3, 5, 19, 23

Textbook Section 5.5   Exercises # 9, 17, 21, 31, 35

Textbook Section 5.6   Exercises # 71, 73

1) Find the domain of each function:

a) $f(x) = \log(12 - 4x)$;   b) $g(x) = \ln(x^2 - 25)$;   c) $h(x) = \log_2 \frac{3 - 4x}{x + 2}$

2) Graph $f(x) = -\log_3(x - 2) + 1$. What is the domain, range, exact intercepts, asymptote.

3) Simplify: $\log(x^2 - 16) - 3[\log(x + 4) + 2\log x]$.

4) Suppose $\ln x = t$. Write the following expression in terms of t: $\dfrac{(\ln x)^3 - \ln(x^4)}{\left(\ln \frac{x}{e^2}\right)\left(\ln(xe^2)\right)}$

5) $f(x) = \ln\left(x + \sqrt{x^2 + 1}\right)$. Find $f^{-1}(x)$.

6) a) Graph $f(x) = 3^{x-1} - 2$. Mention: domain, range, exact intercepts, asymptote.
   b) Is f increasing or decreasing?
   c) Does f have an inverse? Explain.
   d) Find $f^{-1}(x)$. What is the domain and the range of f^{-1}?
   e) Explain how you can obtain the graph of f^{-1} from the graph of f.

Answers: (1) a)$(-\infty, 3)$; b) $(-\infty, -5) \cup (5, \infty)$; c) $\left(-2.\frac{3}{4}\right)$; (3) $\log \frac{x - 4}{(x + 4)^2 x^6}$; (4) t; (5) $f^{-1}(x) = \frac{e^{2x} - 1}{2e^x}$

(6) $x - \cap: (1 + \log_3 2, 0)$; $y - \cap: \left(0, -\frac{5}{3}\right)$

Optional @ 12 points towards Test #3 – due Wednesday
Show all work in order to get credit.
Textbook Summary page 431   Exercises # 1, 3, 9 – 12, 15 – 35 odd
Textbook Review page 468   Exercises # 33, 35, 43 – 55 odd, 57 – 59