

**M123-Intermediate Algebra**  
**Review for sections 12.1-12.6**

Note: This review sheet was created to review the concepts presented in your text. Each instructor may have other problems you should review to prepare for quizzes and exams in your section of the course.

1. Find  $(f \circ g)(x)$  and  $(g \circ f)(x)$  if  $f(x) = x - x^2$  and  $g(x) = 2x + 3$ . (Section 12.1)
2. For each of the following, determine if the function is one-to-one. If the function is one-to-one, then find its inverse. (Section 12.1)
  - a)  $f(x) = x^2$
  - b)  $f(x) = 2x - 5$
  - c)  $f(x) = (x + 5)^3$
3. Graph the function  $f(x) = 2^x - 5$ . (Section 12.2)
4. Simplify each of the following. (Section 12.3)
  - a)  $\log_3 27$
  - b)  $\log_8 2$
  - c)  $5^{\log_5 21}$
5. Convert  $4^{-3} = \frac{1}{64}$  to a logarithmic equation. (Section 12.3)
6. Convert  $\log_2 64 = 6$  to an exponential equation. (Section 12.3)
7. Express the following expression in terms of logarithms of a, b, & c. (Section 12.4)
$$\log \frac{a^3 b^2}{c}$$
8. If  $\log_a 8 = 2.079$  and  $\log_a 5 = 1.609$  find each of the following. (Section 12.4)
  - a)  $\log_a \frac{8}{5}$
  - b)  $\log_a 40$
9. Graph. State the domain and range of the function  $f(x) = e^x + 3$ . (Section 12.5)
10. Solve. Where appropriate, include the approximation to the nearest ten-thousandth. (Section 12.6)
  - a)  $4^x = \frac{1}{64}$
  - b)  $\log_x 81 = 4$
  - c)  $6^{5-2x} = \frac{1}{36}$
  - d)  $5 \ln x = -15$
  - e)  $\ln(4x - 2) = 3$