Sample Test 3—Steve Liebling
MTH 4

3-4, 3-5, 3-6, 4-1, 4-2, 5-1, 5-3

Your Name

MULTIPLE CHOICE In the following multiple choice questions, **circle** the answer (either (a), (b), (c), (d), or (e)) that *best* answers the question. There is no partial credit for these. Each is also worth the same amount, 1 point.

1. Find the vertex form of $f(x) = x^2 - 4x + 4$
2. Where is the maximum or minimum of the function $f(x) = 2(x+3)^2 - 3$?
3. What is the equation of the axis of symmetry of the function $f(x) = 3(x-4)^2 + 1$?
4. Let $f(x) = 2x^2$ and $g(x) = 3(x+2)$. Evaluate $(f+g)(-4)$.
5. Let $f(x) = 2x^2$ and $g(x) = 3(x+2)$. Evaluate $(f \circ g)(-4)$.
6. Construct the inverse (if it exists) of the function $f(x) = 3x^3 - 1$.
7. Where are all the real zeros of the function $P(x) = (x^2 - 9)(x+3)$
8. Sketch the function $P(x) = 4x^8 - 5$ making sure to get the left and right behavior correct.
9. Compute $4^{-\sqrt{4}}$.
10. Simplify $e^8 e^{-3}$.
11. Simplify $\frac{3^{2x}}{3^{-2}}$
12. Solve for x in the equation $7^{2x} = 49^{-x+2}$
13. Compute $\log_6 216$.
14. Compute $\log_e e^{-10}$.
15. Solve for x in the equation $log_2 x = 512$.

1. (2pts) A scientist comes with a function which purports to predict someone's weight, w in pounds, based only on their height h in inches: $w(h) = 5.3h - 200$. Construct its inverse...a function which predicts someone's height based only on their weight.
2. (2pts) Use the bisection method to obtain a one-decimal-place approximation of the zero of the function:
$$P(x) = x^3 + 4x^2 - 3x - 17$$
in the interval $(1, 4)$.
3. (2pt) Bank A offers interest at a rate of 3% compouned monthly and Bank B offers interest compounded continuously at a rate of 2.9%. If you have $\$10,000$ to invest for three years, which offer is better and by how much money?