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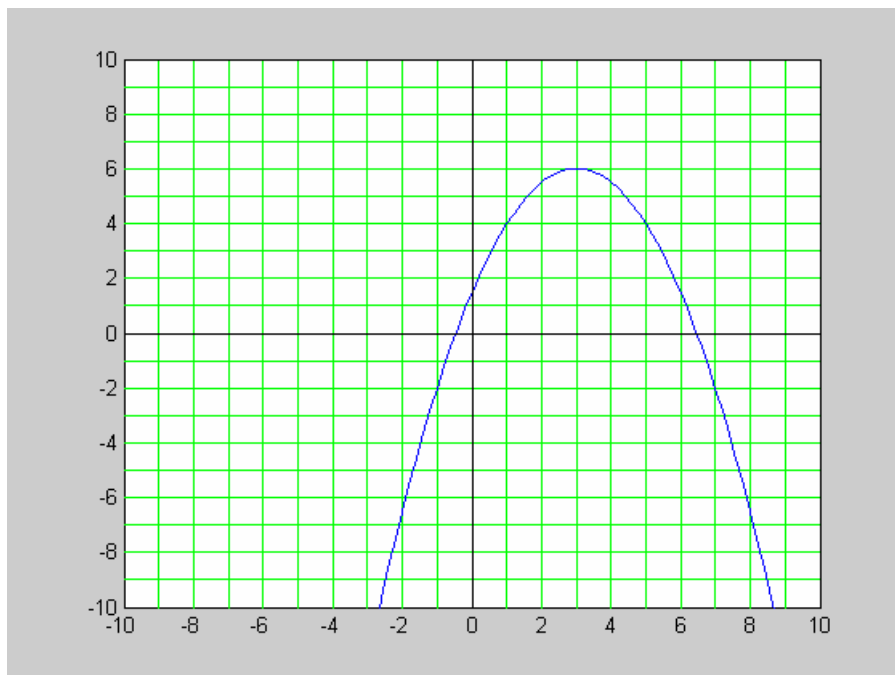
Math 100G – Exam 2
October 10, 2006

1. Solve $3x^2 + 10x - 8 = 0$.

2. Write $x^2 + 6x - 4$ in the form $a(x - h)^2 + k$.

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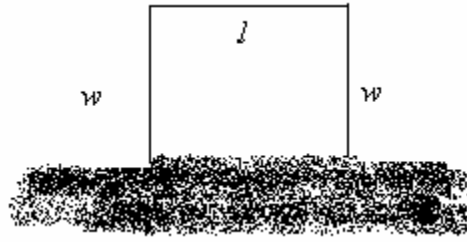
3. Write the equation for the parabola whose graph has its vertex at $(3,6)$ and which passes through the point $(7,-2)$ in the form $y = ax^2 + bx + c$.



4. If revenue is given by $R(x) = 2000x - 0.1x^2$ and costs are given by $C(x) = 500x + 0.2x^2 + 150,000$, what is the maximum profit?

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5. You wish to fence in a pasture along a river using 300 meters of fence as shown (note that no fencing is required along the riverbank). What is the maximum area you can enclose?



6. Let $f(x) = 1 + \sqrt{3 - 2x}$ on the domain $x < 1.5$. What is $f^{-1}(x)$?

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7. Let $f(x) = 2x^2 + 4x - 3$ and $g(x) = 3x - 4$. Compute

- $f(x)g(x)$

- $f(g(x))$

- $g(f(x))$.

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8. Solve $|2x + 5| = 3x - 4$.

9. Solve $|3x - 4| < 10$.

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10. Solve $x - 3 = \sqrt{21 - 2x}$

11. Solve $x^2 + 7x + 1 > 4x + 11$.

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12. Suppose blood cholesterol levels could be modeled by the function $f(x) = 4.7x^{0.7} + 95$ where x is average fat consumed per day (in grams). According to this model, if someone who currently consumes 100g of fat per day cuts their average fat intake in half, how much would that reduce their cholesterol?

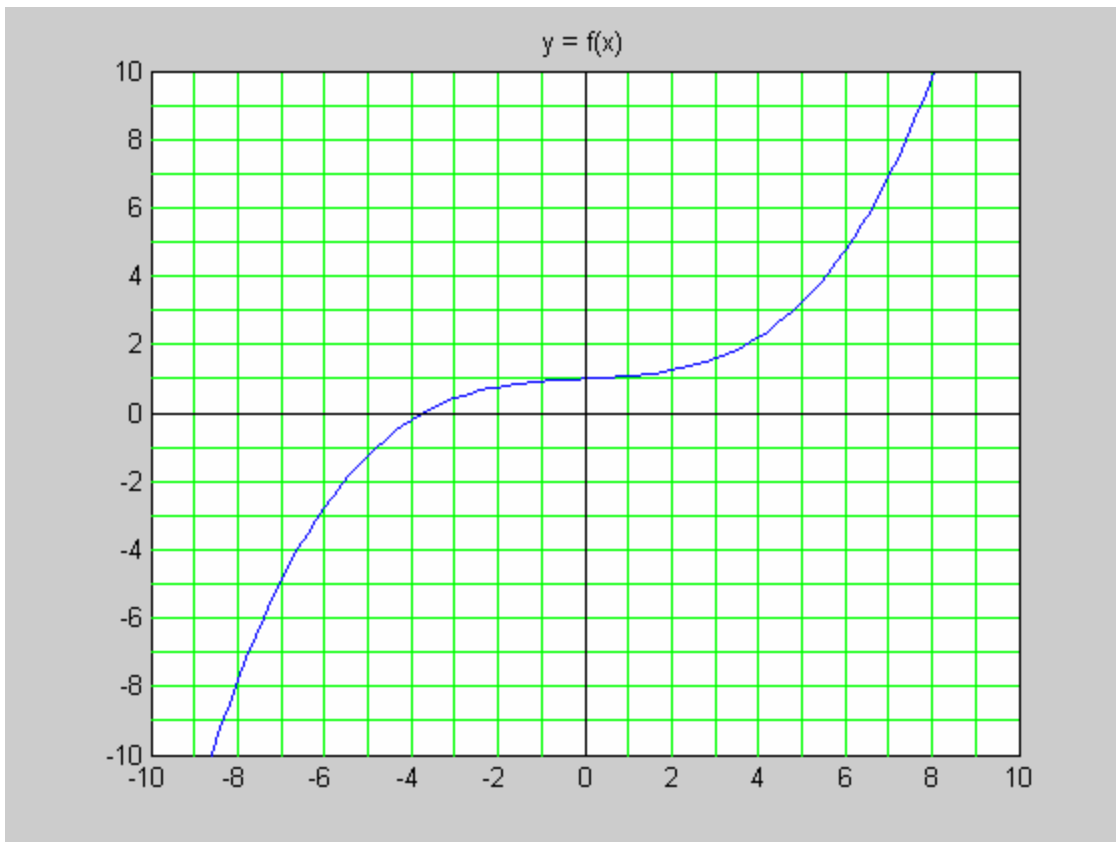
13. Suppose bank profits are a function of interest rates, with profit P in thousands of dollars modeled by $P = 15,000i - 65,000i^2 - 600$ where i is the prime interest rate. Suppose interest rates are a function of the federal deficit, $i = 0.04 + 0.0002D$ where D is the annual deficit in billions of dollars. Write bank profits as a function of the federal deficit. For full credit, you must simplify the formula as much as possible.

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14. Suppose Microserf bills for online access with a base rate of \$4.00 per month plus \$1 for every 15 minutes or fraction thereof. The Wildebeast corporation charges for access at a rate of \$6.00 per hour or fraction thereof, with no minimum. Draw a graph that illustrates the price vs. time for each company. For what levels of usage is Microserf the better deal? Explain.

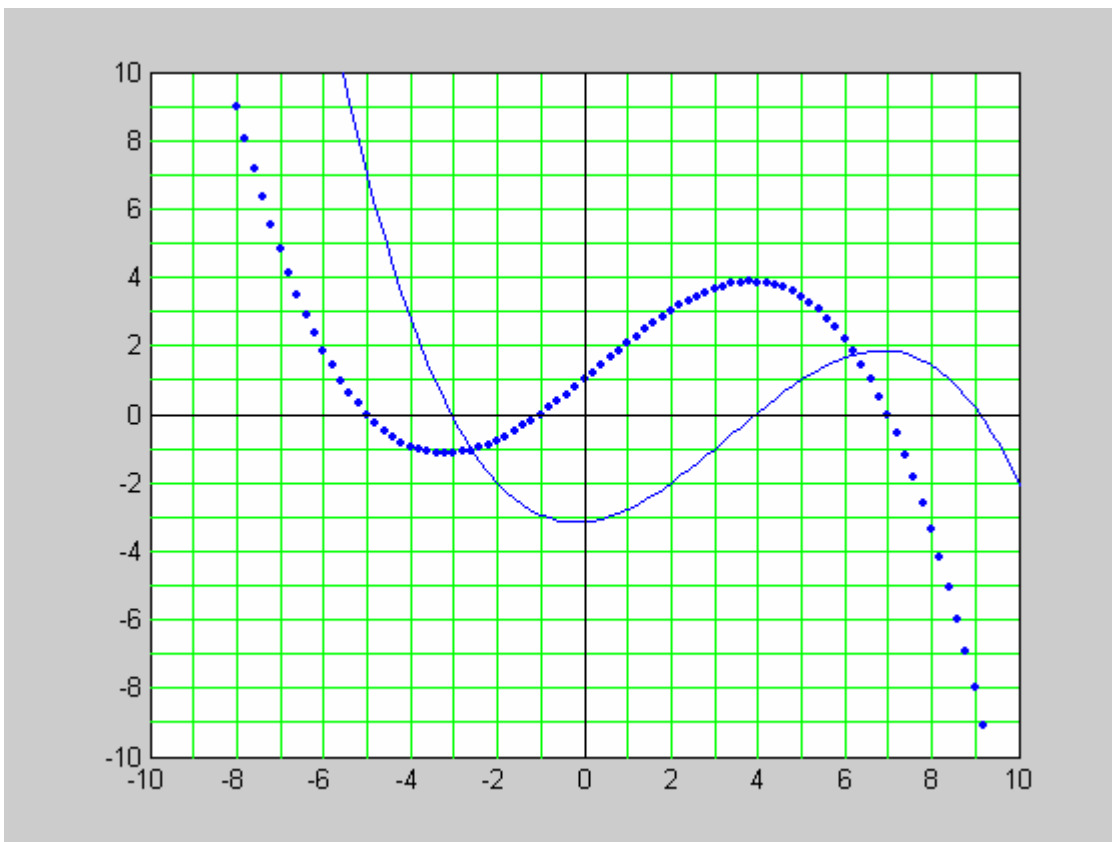
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15. The graph of $y = f(x)$ is shown below. On the same sketch, draw the graph of $y = f^{-1}(x)$.



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16. The graph of $y = f(x)$ is the dotted curve in the figure below. What function is graphed by the solid curve? Write your answer in terms of $f(x)$. Hint, the original graph passes through the lattice points $(-5,0)$, $(-1,0)$, $(2,3)$, and $(7,0)$.



Name: _____

Pledge:

On my honor, as a student, I have neither given nor received unauthorized aid on this

examination: _____

(signature)

(date)

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