

Name: _____

Panther ID: _____

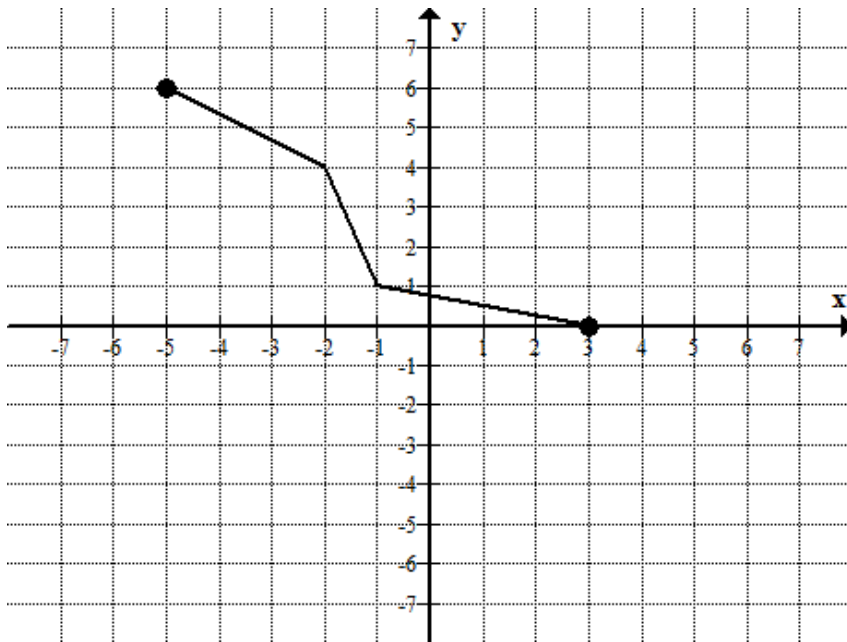
Spring 2014

MAC 1140 - Precalculus Algebra

Test # 3

There are 12 problems for a total of 110 points. **Show your work**; an answer alone, even correct, will get no credit. An illegible answer will not be graded, so write your work neatly. Organize your work, so it is clear what you do and why. It might be necessary to use English sentences to write explanations.

Problem 1. (8 pts) Given the graph of a function f , draw (in the same coordinate space) the graph of the inverse f^{-1} , if it exists.



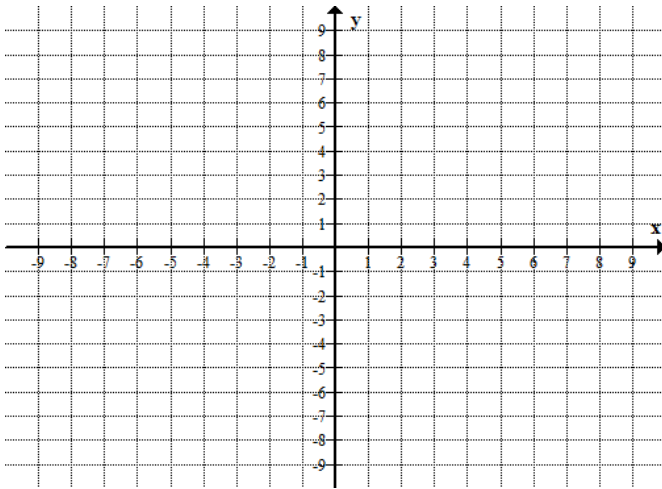
Problem 2. (8 pts) Write the given logarithm as a sum/difference of logarithms. Express exponents as products.

Assume $x > 1$.

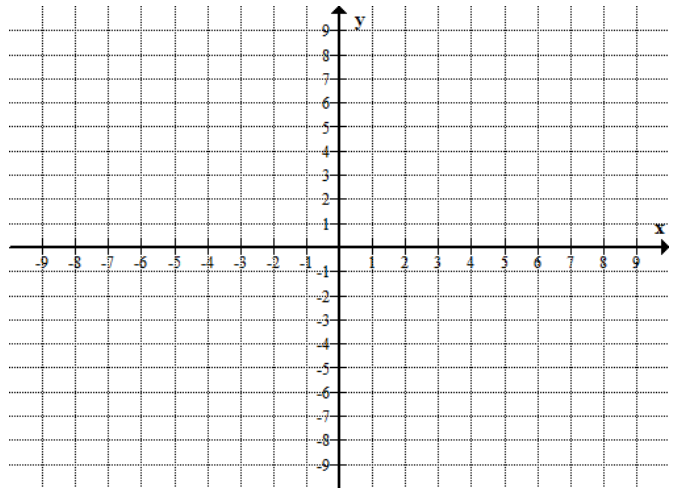
$$\log_3 \frac{x\sqrt{x+1}}{(2x-1)^3(x+7)^2}$$

Problem 3. (8 pts) Use transformations to graph $f(x) = -3\log_4(x-3)$. Start with a basic function, plot accurately 3 points and use them to perform the transformations. Draw the transformations in the order a,b,c,d and write the equation for each intermediate function

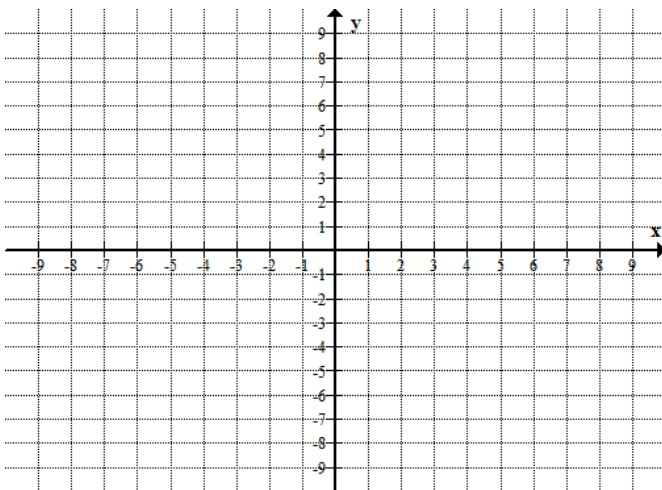
a) $y = \underline{\hspace{2cm}}$



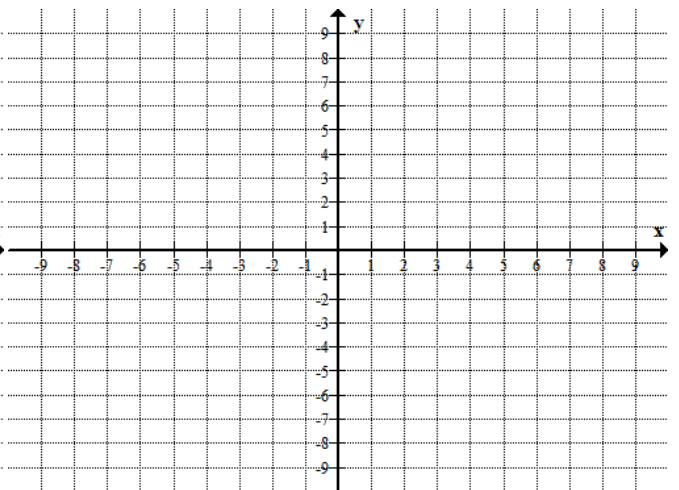
b) $y = \underline{\hspace{2cm}}$



c) $y = \underline{\hspace{2cm}}$



d) $f(x) = -3\log_5(x-3)$



Problem 4. (8 pts) Write as a single logarithm

$$\log_4(x-3) - 5\log_4 x - \frac{1}{2}\log_4(x^2+1) + 2\log_4(3x+5)$$

Problem 5. (27 pts) Solve the following equations

a) $2 \cdot 3^{2x-1} = 18$

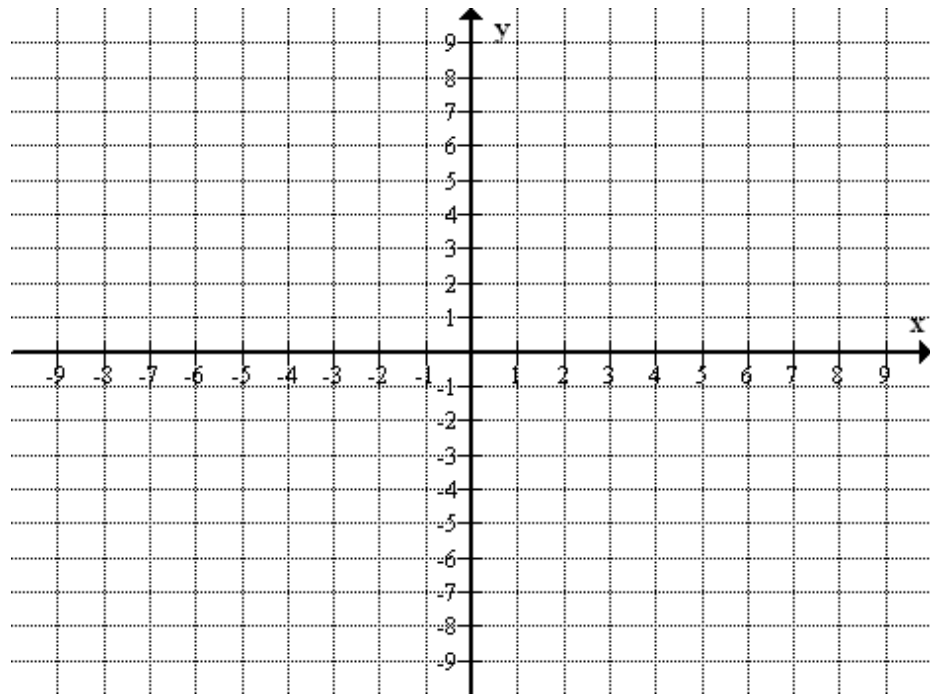
b) $\log_2(x+4) + \log_2(x+3) = 1$

b) $7^{x+1} = 11^{2x}$

Problem 5. (8 pts) Find the inverse of $f(x) = \frac{2-x}{4+5x}$. Show ALL work!

Problem 7. (12 pts) Find the vertex, focus and the equation of the directrix of the parabola given by the equation

$$y^2 - 6y + 8x + 26 = 0. \text{ Graph the equation.}$$



Problem 8. (8 pts) Find the equation of a parabola with the vertex at $(0,0)$ and the directrix $y = 4$. Show your work!

Problem 9. (10 pts) Find the domain of $f(x) = \ln(5 - x^2)$

Problem 10. (4 pts) Write the following expression in the exponential form $\ln(b) = 7$

Problem 11. (4 pts) Find the exact value of $\log_6 \sqrt[3]{36}$

Problem 12. (5 pts) Draw the graph of $f(x) = e^x$. Plot some points as accurately as possible.

