

MONTGOMERY COUNTY COMMUNITY COLLEGE
 MAT 100 – Test 4
 Spring 2005

Graziano

Name _____

1. Match the following graphs by writing the number of the graph next to the equation of the graph next to the equation. If there is no match, write none. (1 pt. each)

a. $y = -x^2 + 2x + 8$ _____

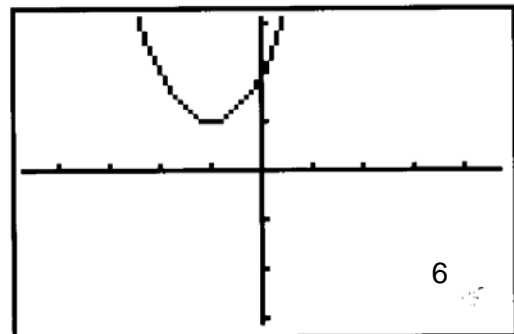
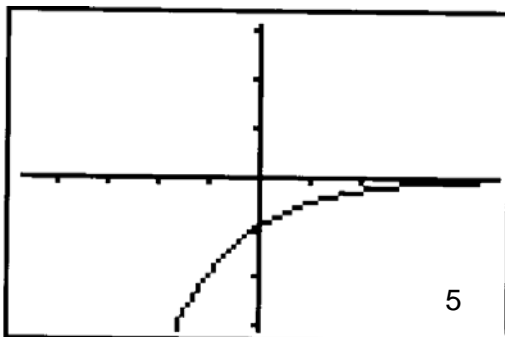
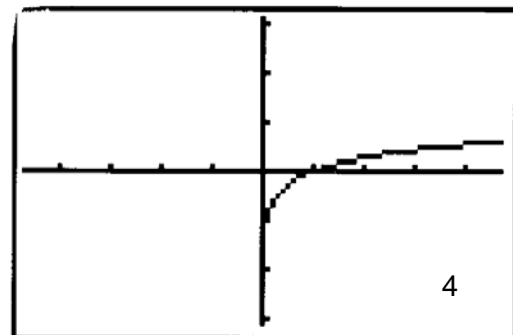
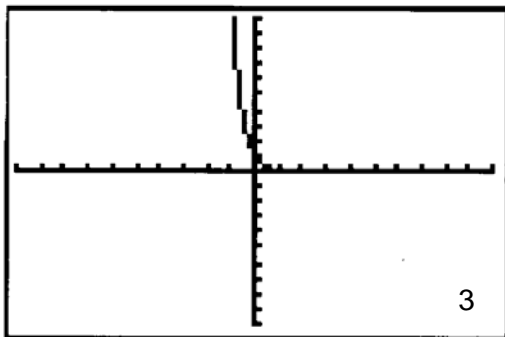
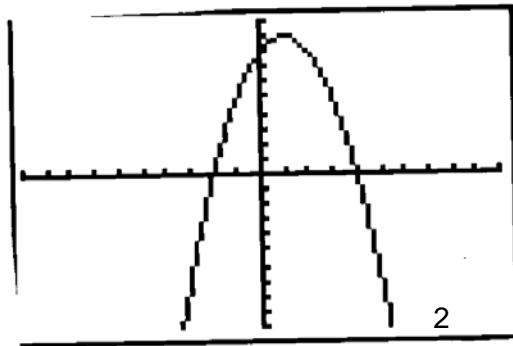
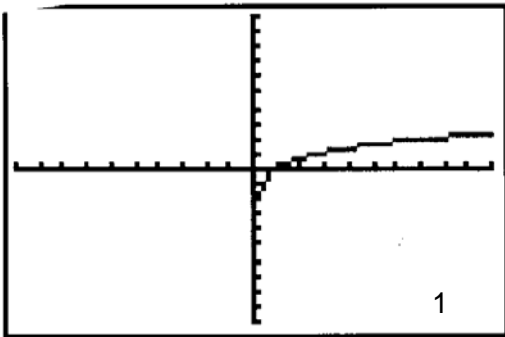
d. $y = 2^x$ _____

b. $y = \log_{12} x$ _____

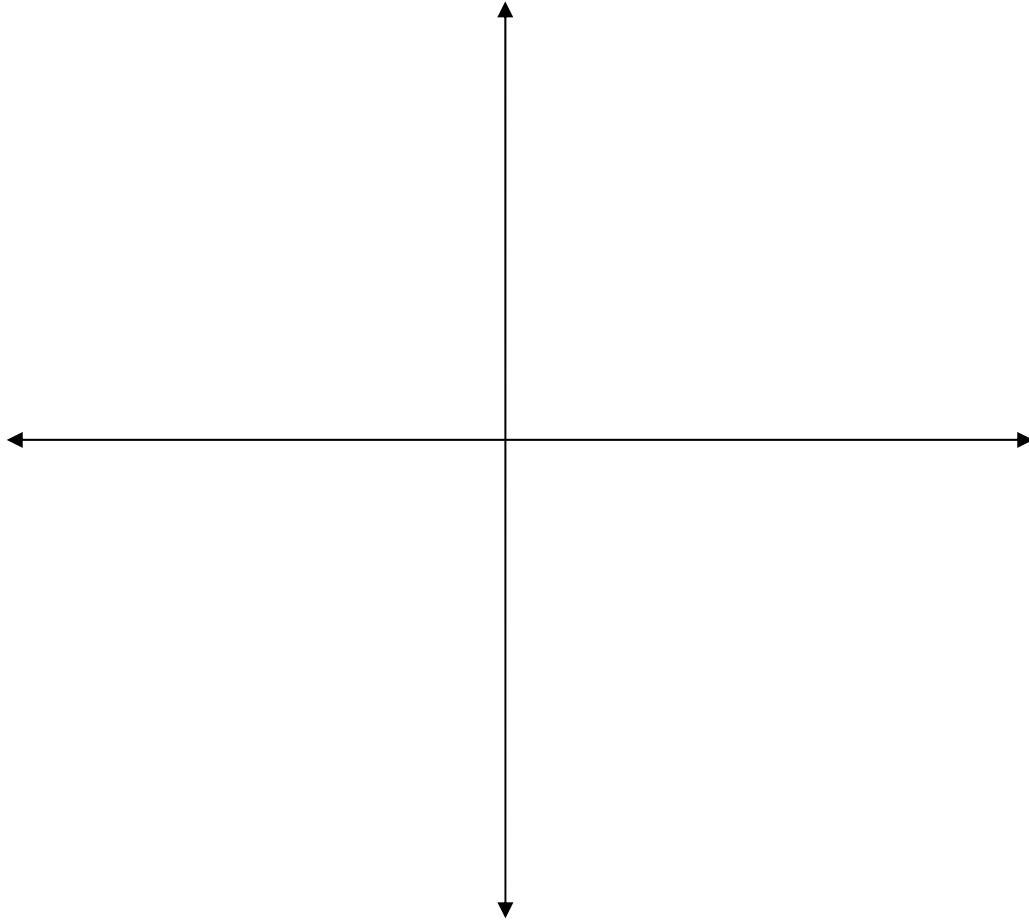
e. $y = \ln x$ _____

c. $y = x^2 + 2x + 2$ _____

f. $y = \left(\frac{1}{12}\right)^x$



2. Graph the function $f(x) = x^2 - 2x - 3$. Label the vertex, y-intercepts, and x-intercepts. Find these points algebraically. (3 pts.)



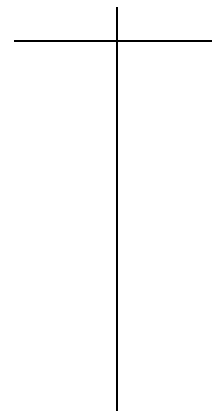
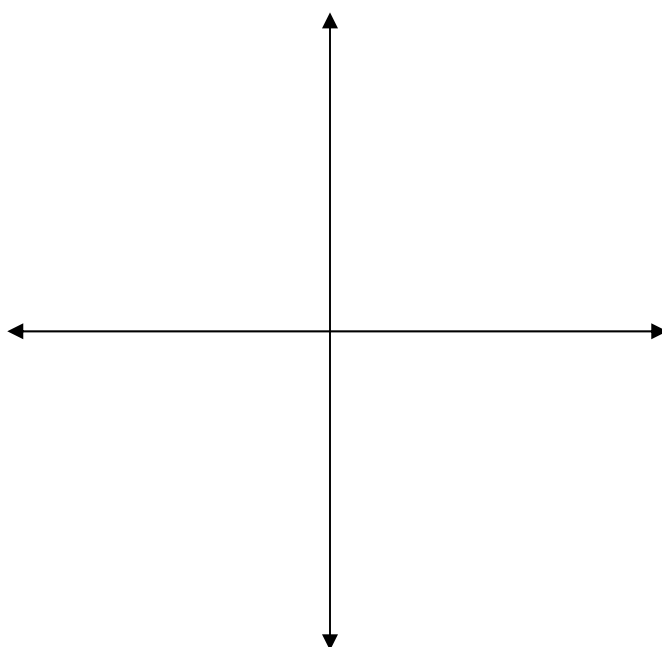
(3 pts.) vertex _____

(3 pts.) x-intercepts _____

(3 pts.) y-intercepts _____

(3 pts.) axis of symmetry _____

3. Draw the graph of $y = \log_2 x$. Please show the table you fill in with at least 3 points, after changing to exponential form. (6 pts.)



4. Solve for x : express answers to 2 decimal places. (6 pts.)

$$x^2 + 3x = 4$$

5. The profit function for a firm is given by:

$$P(x) = -x^2 + 20x + 500$$

- a. How many items (x) must be sold to produce a maximum profit?

(6 pts.) _____

- b. What is the maximum profit?

(6 pts.) _____

6. Find the inverse function for $f(x) = 3x - 5$ (5 pts.)

$$f^{-1}(x) = \underline{\hspace{2cm}}$$

7. Solve for x in the following.(4 pts. each)

a. $\log_x 25 = 2$

$$x = \underline{\hspace{2cm}}$$

b. $\log_3 x = -2$

$$x = \underline{\hspace{2cm}}$$

c. $\log_{25} 5 = x$

$$x = \underline{\hspace{2cm}}$$

8. Use your calculator to find: (4 pts. each)

a. $\log_{10} 3 =$ _____

b. $\ln 6 =$ _____

Use the formula $\text{PH} = -\log [\text{H}^+]$ for numbers 9, 10.

9. Find the hydrogen ion concentration of a substance with a $\text{PH} = 4.8$. (6 pts.)

10. The hydrogen ion of shampoo is 1.9×10^{-5} . Find the PH . (6 pts.)

11. The spread of AIDS is approximated by the function $N(t) = 100(1.3)^t$ where $t = 1987$. Calculate the following

a. $N(0) = \frac{\quad}{(2 \text{ pts.})}$ $N(2) = \frac{\quad}{(2 \text{ pts.})}$ $N(5) = \frac{\quad}{(2 \text{ pts.})}$ $N(8) = \frac{\quad}{(2 \text{ pts.})}$

b. Graph the function. (5 pts.)