

NAME: \_\_\_\_\_

# MATH 128 TEST 1 SAMPLE

PLEASE SHOW ALL WORK!

1.) Solve:  $|3 - x| - 4 = 3$

1. \_\_\_\_\_

2.) Solve. Give answer in interval notation and graph the

solution set:  $\left| \frac{2x + 2}{4} \right| - 3 \geq -1$

2. \_\_\_\_\_

\_\_\_\_\_

3.) Identify the center and radius:  $x^2 + y^2 + 12x - 14y + 68 = 0$   
Do not graph.

center: \_\_\_\_\_

radius: \_\_\_\_\_

4.) Find the domain:  $f(x) = \frac{|x - 4|}{\sqrt{7x - 3}}$

Write your answer in interval notation.

4. \_\_\_\_\_

5.) (10 pts) Find the intercepts and indicate what kind of symmetry this graph has:  $x - y^3 = 8$ . Is it a function (yes or no)? Classify as even, odd, or neither (circle your choice)

x-int: \_\_\_\_\_

y-int: \_\_\_\_\_

sym: \_\_\_\_\_

Function? \_\_\_\_\_

Even    Odd    Neither

6.) Find the difference quotient for  $f(x) = 3 - 2x^2$  by using  $\frac{f(x+h) - f(x)}{h}$ .

6. \_\_\_\_\_

7.) (15 points) Let  $f(x) = \frac{9}{x^2 - 9}$  and  $g(x) = 3x$

a.) Find  $(f \circ g)(1)$

7a. \_\_\_\_\_

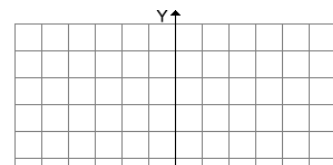
b.) Find  $(g \circ f)(x)$ . Factor if possible.

7b. \_\_\_\_\_

c.) Find  $(f \circ g)(x)$ . Factor if possible.

7c. \_\_\_\_\_

8.) Graph using transformations:  $y = -(x - 3)^2 + 4$



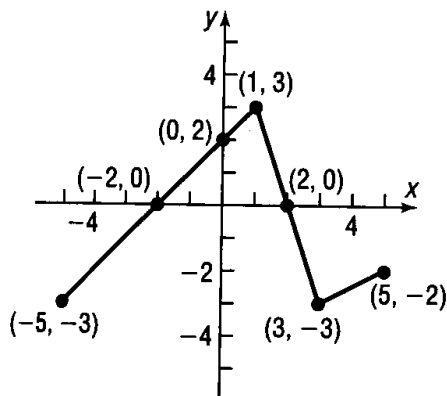
Identify the intercepts.

x-int: \_\_\_\_\_

y-int: \_\_\_\_\_

9.) Find  $f^{-1}(x)$  if  $f(x) = \sqrt[5]{3x+5}$ . You do NOT need to do a check to verify your answer. 9. \_\_\_\_\_

10.) (10 points) Use the graph below to answer the questions.



a.) Find  $f(5)$  10a. \_\_\_\_\_

b.) Find all values of  $x$  such that  $f(x) = -3$ . 10b. \_\_\_\_\_

c.) Find the domain. 10c. \_\_\_\_\_

d.) Find the range. 10d. \_\_\_\_\_

e.) Interval(s) of decreasing 10e. \_\_\_\_\_

f.) List the number at which the graph has local max. 10f. \_\_\_\_\_

g.) What is the value of the local minimum? 10g. \_\_\_\_\_

h.) Is  $f(-2.5)$  positive or negative? 10h. \_\_\_\_\_

11.) Find the vertex only. DO NOT GRAPH: 11. \_\_\_\_\_

$$y = 12x^2 - 12x - 5$$

12.) (10 points) You are choosing between two long-distance telephone plans. Plan 1 has a monthly fee of \$15 with a charge of \$0.08 per minute for all long distance calls. Plan 2 has a monthly fee of \$3 with a charge of \$0.12 per minute for all long distance calls.

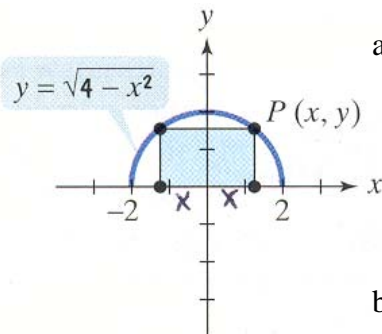
a.) Express the monthly cost, C, for plan 1 as a function of the number of minutes of long-distance calls in a month, x. a. \_\_\_\_\_

b.) Express the monthly cost, C, for plan 2 as a function of the number of minutes of long-distance calls in a month, x. b. \_\_\_\_\_

c.) For how many minutes of long-distance calls will the costs for the two plans be the same? c. \_\_\_\_\_

13.) Solve using the quadratic formula:  $3x^2 - 6x - 3 = 0$  13. \_\_\_\_\_  
Do not give decimal answers.

14.) (10 points) The figure below shows a rectangle with two vertices on a semicircle of radius 2 and two vertices on the x-axis. Let  $P(x, y)$  be the vertex that lies in the first quadrant.



a.) Express the area of the rectangle, A, as a function of x. a. \_\_\_\_\_

b.) Express the perimeter of the rectangle, P, as a function of x. b. \_\_\_\_\_