

Name: \_\_\_\_\_

GTID: \_\_\_\_\_

For the short answer problems on **this page** you do not need to show any work.

For everything else: Show all work and BOX your final answer for each problem. Answers with no work may receive partial or no credit. Simplify answers for full credit.

- 1a. (2 points) What is the domain and range of  $y = 3(x - 4)^2 - 5$ ?

D:

R:

- 1b. (2 points) What is the domain and range of  $y = 2^{x-3} + 4$ ?

D:

R:

- 1c. (2 points) Write the equation for the function which is obtained from the graph of  $y = 4^x$  after being transformed by shifting 2 units up and shifting 1 units left.

2. (5 points) Write in standard form (*i.e.*, vertex form):  $y = 2x^2 - 16x + 22$

3. (5 points) Find the quotient:  $(x^3 - x^2 - 10x + 6) \div (x + 3)$   
*Hint: check your answer.*

4. (6 points) For this problem use the function  $f(x) = \frac{x^2 - 4}{(3x - 1)(x + 1)}$ .

Find the domain of  $y = f(x)$ , the VA(s), the HA, the  $x$ -intercept(s), and the  $y$ -intercept.

D:

VA(s):

HA:

 $x$ -int: $y$ -int:

5. (4 points) Evaluate:  $\log_2(\sqrt{8})$

6. (4 points) Solve:  $\log_3(2x + 4) = 0$

7. (5 points) Evaluate:  $\log_5 \left( \frac{25x^2}{\sqrt{y}} \right)$ , given  $\log_5(x) = 3$  and  $\log_5(y) = 10$ .

8. (4 points) You deposit \$4,000 at 8% compounded quarterly for 6 years. How much will be in your account after 6 years?

*Note: you must clearly set up the problem, but you do not need evaluate the expression.*

9. (6 points) Solve:  $\log_2(x + 2) + \log_2(x + 3) = 1$

10. (5 points) Sketch:  $y = \log_2(x)$ . Label any intercepts, label the axes and the curve, and identify and include a total of at least four points on your graph for full credit.