

MATH 121**Exam 1 Form A**

Circle your discussion time: 8 9 10 11 12 13 14

Last Name _____ **First Name** _____ **SSN** _____

Give complete explanations, not just answers, for full credit. Give exact answers whenever possible, otherwise give answers accurate to two decimal places. Sketch any calculator graph you use including the axes with a scale.

Turn in this sheet with your test booklet. Write your TA's name and your discussion time on the booklet.

1. (10 pts.) Find the domain of the function:

$$f(x) = \frac{\sqrt{x-1}}{x-3}$$

2. (15 pts.) (a) Write an equation for the line through points $(2, -3)$ and $(-2, 3)$.

(b) Write an equation for the line through point $(2, -3)$ that is parallel to the line $x - 2y = 5$.

3. (15 pts.) For the function $y = x^3 - 3x^2 - 6x + 9$, find

(a) all real zeros (x -intercepts);

(b) all local maxima;

(c) the interval where the function is decreasing.

4. (15 pts.) Describe a sequence of transformations that will transform the graph of $f(x) = x^2 + x$ into the graph of the function $g(x) = (x - 3)^2 + (x - 3) - 3$.

5. (15 pts.) Write the function $f(x) = (2x^3 - 9x + 13)^5$ as a composite of two functions, neither of which is the identity function.

6. (15 pts.) Find the inverse of the function $f(x) = \frac{2x - 3}{x + 1}$.

7. (15 pts.) How long does it take an object to reach the ground if it is thrown upward from the top of a 800-foot building, with initial velocity of 56 feet per second?

Note: The position of the object above ground (in feet) after t seconds is given by $h(t) = -16t^2 + v_0t + h_0$ where h_0 is the initial position of the object at $t = 0$, v_0 is the initial velocity of the object at $t = 0$.