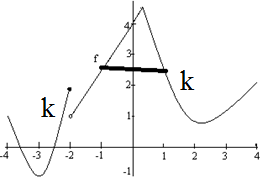
Survey of Calculus sample test 2 Dr. McLean Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



1. The above is the entire graph of a function k. If you can’t see the graph, it is not there. The graph is drawn to scale. The domain of k is [-4, 4] and is differentiable at every point except two and the two endpoints.

a) Where is the absolute maximum?x=0.6 b) Where are the relative minimums? {-3,2.2}

c) Approximate k'(-1). m=1.5 d) Where are the critical points? {-3, -2, 0.6, 2.2}

e) Where is k'(x) < 0? (-4,-3)U(0.6, 2.2) f) Where is k concave up? (-4, -2)U(0.6, 4)  
g) What is the range of k? [-1, 4.5] g) Why is the conclusion of MVT false on [-1,1]? K not diff at x = 0.6 which is in (-1, 1).

2. Differentiate y = .y’ = 4

5. Find where the absolute maximum and the absolute minimum occur of the function

y =  on [-1, 5]. y’ = 

y(-1) = -1/17 => absolute min @ -1; y(4) = 4/32 => absolute max @ 4; y(5) = 5/41

6. If g(x) = , find the equation of the line tangent to the graph of g at the point (5, 4). g’(5) = 11/8 because g’(x) = 

(y-4)/(x-5) = 11/8

7. If f(x) = , find f’. f’(x) = x 3 

8. Suppose . Use implicit differentiation to find  at the point

(1, 1). x2y’ + y(2x) + 4y3y’= -12 🡺 y’(x2 + 4y3) = -2xy – 12 so y’(1,1) = -2/5

9. Suppose f(x) = (x3 /3) – 2x2 +3 x + 12 on all of the real numbers.

a) Find the critical points. f ’(x) = x2 – 4x + 3 = (x – 3) (x – 1) = 0 when x = 1 or x =3.

b) Use the 1st or 2nd derivative test to classify your critical points as relative maximum, relative minimum or neither. Using the first, f ‘(0) = 3 > 0 f ‘(2) = -1 < 0 and f ‘(5) > 0.

Local max @ x = 1 Local min @ x = 3.

c) Where is f increasing? Where f ‘(x) > 0 so (-oo,1) U (3,+oo)

10. If f(x) = , find f’(x). f ‘(x) = 

11. If g(x) = , find g’(x). g’(x) = 