



Math 203  
Quiz II

Time: 55 min

I) Find the derivative of the following :

1)  $y = \sqrt{\frac{x^3 - 3}{x^2 + 1}}$

3)  $y = \frac{5}{\sqrt[3]{x^3}}$

2)  $x y^3 = 6 - x^4 + 2y$

4)  $x + y - \sqrt{2xy} = 0$

II) Find and classify all critical points :

1)  $y = f(x) = \frac{5}{x-9}$

3)  $y = 4x^3 - 3$

2)  $y = 2x + 1$

4)  $y = 3x^5 - 5x^3$

III) Given  $y = f(x) = x^4 - 18x^2$

1) Find and classify all the critical points .

2) Sketch the graph .

3) Using the graph , identify any absolute maximum or minimum.

4) State

- the intervals over which  $f(x)$  is increasing .

- the intervals over which  $f(x)$  is decreasing .

IV) Determine the absolute maximum and the absolute minimum for the following functions over the given intervals

a)  $y = \frac{x-2}{x^2-3}$  ;  $0 \leq x \leq 2$

b)  $x y = 5$  ;  $1 \leq x \leq 5$

V) Find the equations of the tangent lines to the curve :

$x^3 - 2x^2 y + y^2 = 4$  at the point  $x=1$  .

VI) For a certain product , the demand and unit price are related by :

$q = p^2 - 40p + 1250$   $0 \leq p \leq 20$

where  $p =$  The price of one unit ,in \$

$q =$  The quantity demanded at  $p$

a) Find  $\frac{dp}{dq}$

b) Evaluate  $q$  at  $p = 10$  , then interpret ;

c) Evaluate  $\frac{dp}{dq}$  , then interpret;