King Fahd University of Petroleum and Minerals
Math Dept
Test 2 Math 101-1
Sum 2001

Instructions:

Show all of your work
All questions have equal grades

Question #	1	2	3	4	5	6	7	8	9	10	Total
Grade											

Name:_____ I.D.#:_____
Serial #:_____

1. Find the slope of the tangent to the curve $y = 2x + 1^{\frac{4}{3}} \sec^3 \sqrt{x^3 + 1}$,
at $x = 1$.

2. Let $S(t) = 2t^3 - 3t^2 - 12t + 10$, $t \in [-3,3]$, be a position function of a particle moving along a coordinate line. on the interval $[-3,3]$, describe where the particle moves to the right or left, and sketch a diagram describing the motion.

3. Let $f(x) = x^{\frac{4}{3}} - 4x^{\frac{1}{3}}$, find all the critical numbers. Give the intervals where $f(x)$ is
  a. Increasing
  b. Decreasing
  c. Concave up
  d. Concave down.

4. Let $f\,x \quad x^4 \quad 4x^2$, sketch a complete graph of $f\,x$ showing symmetry, increasing - dcreasing , concavity , and relative extrema.

5. Find the points on the parabola $y \quad 2x^2$, closest to the point $P\,1,0$.

6. water is running out of an inverted conical tank so that the height of the water is changing at a rate of $2ft/\min$. At what rate the volume is changing when the height of the water is $6ft$. The height of the tank is $10ft$ and the radius of the tank is $5ft$. $V = \frac{\pi}{3}r^2h$

7. If y is defined implicitly by $x^2y + xy^2 = 2$,then estimate the change in y at the point $P(1,1)$,if x changes from 1 to 0.9.

8. Use Newton's method to approximate where the two graphs $y = x$, and $y = \cos x$ intersect.

9. Find $\frac{d}{dx} f\left(5\sqrt{x}\right)$ if $\frac{df(x)}{dx} = 2x^2$.

10. Find all the critical numbers of $f(x) = \cos 2x + 2\cos x$, $x \in [0, 2\pi]$.