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The Hashemite University
Department of Mathematics

Calculus I
Second Exam

Date 12-11-2012

Time: One Hour

اسم الطالب: محمد صالح محمد الخوالدة الرقم الجامعي: ١٣٣١٥٦٧ الرقم المتسلسل: ٢٥

وقت المحاضرة: ١٢-١١-٢٠١٢ اسم المدرس: الأستاذ محمد قدومي

1	2	3	4	5	6	7	8	9	10	11	12
a	a	a	a	a	a	a	a	a	a	a	a
b	b	b	b	b	b	b	b	b	b	b	b
c	c	c	c	c	c	c	c	c	c	c	c
d	d	d	d	d	d	d	d	d	d	d	d

1) Let f and g be differentiable at $x = 1$, such that $f(1) = 1$, $f'(1) = 2$, $g(1) = -2$ and

$g'(1) = 4$, then $\frac{d}{dx}(g(x)\sqrt{f(x)})|_{x=1} =$

- a) 5 **b) 2** c) $-\frac{5}{2}$ d) $\frac{5}{2}$

2) If $f(2) = 1$, $g(x) = \ln(x^3 + 1)$, and $(g \circ f)'(2) = 6$, then $f'(2) =$

- a) 7 b) -3 **c) 4** d) 8

3) The equation of the tangent line to the curve

$f(x) = \sin^2 x - x \cos x^2 + 3$ at $x = 0$ is given by

- a) $y = x + 3$ b) $y = x - 3$ c) $y = -x - 3$ **d) $y = -x + 3$**

4) The critical point(s) of $f(x) = x + \frac{4}{x}$ is (are)

- a) 0 only **b) -2 and 0 and 2** c) -2 and 2 d) 2 only

5) The values of k and m that make

$$f(x) = \begin{cases} \frac{1}{x} + x & , x > 1 \\ kx - m & , x \leq 1 \end{cases} \text{ differentiable at } x=1 \text{ are:}$$

- a) $k=0, m=-2$ b) $k=0, m=2$
 c) $k=-1, m=2$ d) $k=1, m=2$

6) $\lim_{x \rightarrow \infty} \left(\frac{x+2}{x+7} \right)^{-2x} =$

- a) e^4 b) e^6 c) e^8 d) e^{10}

7) The value of (c) such that the line $y = -x - 4$, is tangent to the curve $y = c\sqrt{x}$

- a) $c = -4$ b) $c = -2$ c) $c = 2$ d) $c = 4$

8) If $2x^2 + y^2 = 2$, then $\frac{d^2y}{dx^2} =$

- a) $-\frac{4}{y^3}$ b) $\frac{4}{y^3}$ c) $-\frac{6}{y^3}$ d) $\frac{6}{y^3}$

9) One of the following is an inflection point for $f(x) = \frac{x^2}{x^2+3}$

- a) $(-1, \frac{1}{4})$ b) $(0, \frac{1}{3})$ c) $(1, \frac{4}{7})$ d) $(-2, \frac{4}{7})$

10) $f(x) = \frac{x^2}{x^2+3}$ increasing in

- a) $[-1, 1]$ b) $[1, \infty)$ c) $(-\infty, 0]$ d) $[0, \infty)$

11) $f(x) = \frac{x^2}{x^2+3}$ concave down in

- a) $[-1, 1]$ b) $(-\infty, -1) \cup (1, \infty)$ c) $(-1, 1)$ d) $[0, \infty)$

12) $f(x) = \frac{x^2}{x^2+3}$ has absolute maximum at

- a) $x = -1$ b) $x = 0$ c) $x = 1$ d) non of these