King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics

Math 101
Exam II (PART 1)
063
Tuesday 7/8/2007

EXAM COVER

Number of versions: 4
Number of questions: 9
Number of Answers: 5 per question

This exam was prepared using mcqs
For questions send an email to Dr. Ibrahim Al-Lehyani (iallehyani@kaau.edu.sa)

King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics

Math 101
Exam II (PART 1)
063
Tuesday 7/8/2007
Net Time Allowed: (For both pats) 90 minutes

MASTER VERSION

1. If $f(x) = (x^6 + 1)^5(3x + 2)^3$, then $f'(0)$ equals

   (a) 36

   (b) 4

   (c) 9

   (d) -9

   (e) -4

2. $\lim_{x \to 0} \dfrac{2 - 2\cos^2 3x}{x \tan x} =$

   (a) 18

   (b) 9

   (c) 6

   (d) 2

   (e) $\dfrac{1}{9}$

3. If $y = e^{x^2} \tan^3\left(3x + \frac{\pi}{4}\right)$, then $\left.\frac{dy}{dx}\right|_{x=0}$ equals

(a) 18

(b) 19

(c) 17

(d) 6

(e) 15

4. If $f(x) = \sqrt{x}\, g(\sqrt{x})$ and $g(1) = 2,\ g'(1) = 2,\ g''(1) = 4$, then $f''(1)$ equals

(a) 1

(b) $\frac{31}{4}$

(c) $\frac{-1}{2}$

(d) 3

(e) 2

5. If $y = \sin^{-1}\left(\frac{1}{x^2}\right)$, then $\frac{dy}{dx} =$

(a) $\frac{-2}{x\sqrt{x^4-1}}$

(b) $\frac{x^2}{\sqrt{1-x^4}}$

(c) $\frac{-2x}{1+x^4}$

(d) $\frac{-2}{x\sqrt{1-x^4}}$

(e) $\frac{x^2}{\sqrt{x^4-1}}$

6. If $x^3 - y^3 = 8$, then $\frac{d^2y}{dx^2} =$

(a) $\frac{-16x}{y^5}$

(b) $\frac{2x^4 - 2xy^3}{y^5}$

(c) $\frac{2xy^3 + 2x^4}{y^5}$

(d) $\frac{2x - 2xy}{y^2}$

(e) $\frac{8x}{y^5}$

7. If $f(x) = x^{x^2+2}$, then $f'(2)$ equals

(a) $2^6(3 + 4\ln 2)$

(b) $2^6(3 + 6\ln 2)$

(c) $(3 + 4\ln 2)$

(d) $2^8 \ln 2$

(e) $2^8 6$

8. If $f(x) = \tanh^{-1}(\sinh x)$, then $f'(\ln 2) =$

(a) $\dfrac{20}{7}$

(b) $\dfrac{16}{7}$

(c) $\dfrac{4}{5}$

(d) $\dfrac{16}{25}$

(e) $\dfrac{-4}{3}$

9. By using the linearization of $f(x) = \sqrt{1+x}$, at $x = 0$, the approximate value of $\sqrt{\frac{3}{2}}$ is equal to

(a) $\frac{5}{4}$

(b) 1

(c) $\frac{3}{4}$

(d) $\frac{3}{2}$

(e) $\frac{7}{4}$

King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics

CODE 001 **Math 101** **CODE 001**

Exam II (PART 1)
063
Tuesday 7/8/2007
Net Time Allowed: (For both pats) 90 minutes

Name: _____

ID: _____ Sec: _____.

Check that this part has 9 questions.

Important Instructions:

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2. Use HB 2.5 pencils only.
3. Use a good eraser. DO NOT use the erasers attached to the pencil.
4. Write your name, ID number and Section number on the examination paper and in the upper left corner of the answer sheet.
5. When bubbling your ID number and Section number, be sure that the bubbles match with the numbers that you write.
6. The Test Code Number is already bubbled in your answer sheet. Make sure that it is the same as that printed on your question paper.
7. When bubbling, make sure that the bubbled space is fully covered.
8. When erasing a bubble, make sure that you do not leave any trace of penciling.

1. If $y = \sin^{-1}\left(\frac{1}{x^2}\right)$, then $\frac{dy}{dx} =$

(a) $\frac{x^2}{\sqrt{x^4 - 1}}$

(b) $\frac{-2}{x\sqrt{1 - x^4}}$

(c) $\frac{x^2}{\sqrt{1 - x^4}}$

(d) $\frac{-2}{x\sqrt{x^4 - 1}}$

(e) $\frac{-2x}{1 + x^4}$

2. If $f(x) = x^{x^2+2}$, then $f'(2)$ equals

(a) $2^8 \ln 2$

(b) $2^8 6$

(c) $2^6(3 + 4\ln 2)$

(d) $(3 + 4\ln 2)$

(e) $2^6(3 + 6\ln 2)$

3. If $f(x) = \sqrt{x}\, g(\sqrt{x})$ and $g(1) = 2,\ g'(1) = 2,\ g''(1) = 4,$ then $f''(1)$ equals

(a) 3

(b) $\dfrac{-1}{2}$

(c) 2

(d) $\dfrac{31}{4}$

(e) 1

4. $\lim\limits_{x\to 0} \dfrac{2 - 2\cos^2 3x}{x \tan x} =$

(a) 6

(b) 18

(c) 2

(d) $\dfrac{1}{9}$

(e) 9

5. If $f(x) = (x^6 + 1)^5(3x + 2)^3$, then $f'(0)$ equals

(a) -4

(b) 9

(c) 36

(d) -9

(e) 4

6. If $x^3 - y^3 = 8$, then $\dfrac{d^2y}{dx^2} =$

(a) $\dfrac{-16x}{y^5}$

(b) $\dfrac{8x}{y^5}$

(c) $\dfrac{2xy^3 + 2x^4}{y^5}$

(d) $\dfrac{2x - 2xy}{y^2}$

(e) $\dfrac{2x^4 - 2xy^3}{y^5}$

7. If $y = e^{x^2} \tan^3\left(3x + \frac{\pi}{4}\right)$, then $\left.\frac{dy}{dx}\right|_{x=0}$ equals

(a) 18

(b) 15

(c) 19

(d) 17

(e) 6

8. By using the linearization of $f(x) = \sqrt{1+x}$, at $x = 0$, the approximate value of $\sqrt{\frac{3}{2}}$ is equal to

(a) $\frac{7}{4}$

(b) $\frac{3}{2}$

(c) $\frac{5}{4}$

(d) 1

(e) $\frac{3}{4}$

9. If $f(x) = \tanh^{-1}(\sinh x)$, then $f'(\ln 2) =$

(a) $\dfrac{-4}{3}$

(b) $\dfrac{16}{7}$

(c) $\dfrac{4}{5}$

(d) $\dfrac{16}{25}$

(e) $\dfrac{20}{7}$

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64	a	b	c	d	e	f
65	a	b	c	d	e	f
66	a	b	c	d	e	f
67	a	b	c	d	e	f
68	a	b	c	d	e	f
69	a	b	c	d	e	f
70	a	b	c	d	e	f

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CODE 002 **Math 101** **CODE 002**

Exam II (PART 1)
063
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7. When bubbling, make sure that the bubbled space is fully covered.
8. When erasing a bubble, make sure that you do not leave any trace of penciling.

1. If $y = e^{x^2} \tan^3\left(3x + \frac{\pi}{4}\right)$, then $\left.\frac{dy}{dx}\right|_{x=0}$ equals

(a) 19

(b) 6

(c) 17

(d) 18

(e) 15

2. If $x^3 - y^3 = 8$, then $\frac{d^2y}{dx^2} =$

(a) $\frac{2xy^3 + 2x^4}{y^5}$

(b) $\frac{2x - 2xy}{y^2}$

(c) $\frac{2x^4 - 2xy^3}{y^5}$

(d) $\frac{-16x}{y^5}$

(e) $\frac{8x}{y^5}$

3. If $f(x) = x^{x^2+2}$, then $f'(2)$ equals

(a) $(3 + 4\ln 2)$

(b) $2^6(3 + 4\ln 2)$

(c) $2^6(3 + 6\ln 2)$

(d) $2^8 \ln 2$

(e) $2^8 6$

4. If $f(x) = (x^6 + 1)^5(3x + 2)^3$, then $f'(0)$ equals

(a) 36

(b) 4

(c) -4

(d) -9

(e) 9

5. If $f(x) = \sqrt{x}\, g(\sqrt{x})$ and $g(1) = 2,\ g'(1) = 2,\ g''(1) = 4$, then $f''(1)$ equals

(a) 2

(b) $\dfrac{31}{4}$

(c) 3

(d) $\dfrac{-1}{2}$

(e) 1

6. By using the linearization of $f(x) = \sqrt{1+x}$, at $x = 0$, the approximate value of $\sqrt{\dfrac{3}{2}}$ is equal to

(a) $\dfrac{5}{4}$

(b) $\dfrac{3}{2}$

(c) $\dfrac{7}{4}$

(d) $\dfrac{3}{4}$

(e) 1

7. If $y = \sin^{-1}\left(\frac{1}{x^2}\right)$, then $\frac{dy}{dx} =$

(a) $\frac{-2x}{1+x^4}$

(b) $\frac{x^2}{\sqrt{x^4-1}}$

(c) $\frac{-2}{x\sqrt{x^4-1}}$

(d) $\frac{x^2}{\sqrt{1-x^4}}$

(e) $\frac{-2}{x\sqrt{1-x^4}}$

8. If $f(x) = \tanh^{-1}(\sinh x)$, then $f'(\ln 2) =$

(a) $\frac{16}{25}$

(b) $\frac{16}{7}$

(c) $\frac{4}{5}$

(d) $\frac{-4}{3}$

(e) $\frac{20}{7}$

9. $\lim_{x \to 0} \dfrac{2 - 2\cos^2 3x}{x \tan x} =$

(a) 2

(b) 6

(c) $\dfrac{1}{9}$

(d) 18

(e) 9

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67	a	b	c	d	e	f
68	a	b	c	d	e	f
69	a	b	c	d	e	f
70	a	b	c	d	e	f

King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics

CODE 003 **Math 101** **CODE 003**

Exam II (PART 1)
063
Tuesday 7/8/2007
Net Time Allowed: (For both pats) 90 minutes

Name: _____

ID: _____ Sec: _____.

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8. When erasing a bubble, make sure that you do not leave any trace of penciling.

1. If $y = \sin^{-1}\left(\frac{1}{x^2}\right)$, then $\frac{dy}{dx} =$

(a) $\frac{-2}{x\sqrt{x^4-1}}$

(b) $\frac{x^2}{\sqrt{1-x^4}}$

(c) $\frac{x^2}{\sqrt{x^4-1}}$

(d) $\frac{-2x}{1+x^4}$

(e) $\frac{-2}{x\sqrt{1-x^4}}$

2. If $f(x) = \tanh^{-1}(\sinh x)$, then $f'(\ln 2) =$

(a) $\frac{-4}{3}$

(b) $\frac{4}{5}$

(c) $\frac{16}{7}$

(d) $\frac{16}{25}$

(e) $\frac{20}{7}$

3. If $y = e^{x^2} \tan^3\left(3x + \frac{\pi}{4}\right)$, then $\left.\frac{dy}{dx}\right|_{x=0}$ equals

(a) 6

(b) 18

(c) 15

(d) 17

(e) 19

4. If $f(x) = (x^6 + 1)^5(3x + 2)^3$, then $f'(0)$ equals

(a) 4

(b) -4

(c) 9

(d) -9

(e) 36

5. By using the linearization of $f(x) = \sqrt{1+x}$, at $x = 0$, the approximate value of $\sqrt{\frac{3}{2}}$ is equal to

(a) $\frac{7}{4}$

(b) $\frac{3}{4}$

(c) $\frac{3}{2}$

(d) 1

(e) $\frac{5}{4}$

6. If $f(x) = \sqrt{x}\, g(\sqrt{x})$ and $g(1) = 2,\ g'(1) = 2,\ g''(1) = 4$, then $f''(1)$ equals

(a) $\frac{31}{4}$

(b) $\frac{-1}{2}$

(c) 2

(d) 1

(e) 3

7. If $f(x) = x^{x^2+2}$, then $f'(2)$ equals

(a) $2^8 \ln 2$

(b) $2^6(3 + 6 \ln 2)$

(c) $(3 + 4 \ln 2)$

(d) $2^8 6$

(e) $2^6(3 + 4 \ln 2)$

8. If $x^3 - y^3 = 8$, then $\dfrac{d^2y}{dx^2} =$

(a) $\dfrac{2x - 2xy}{y^2}$

(b) $\dfrac{2x^4 - 2xy^3}{y^5}$

(c) $\dfrac{8x}{y^5}$

(d) $\dfrac{2xy^3 + 2x^4}{y^5}$

(e) $\dfrac{-16x}{y^5}$

9. $\lim_{x \to 0} \dfrac{2 - 2\cos^2 3x}{x \tan x} =$

(a) 2

(b) 18

(c) $\dfrac{1}{9}$

(d) 6

(e) 9

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67	a	b	c	d	e	f
68	a	b	c	d	e	f
69	a	b	c	d	e	f
70	a	b	c	d	e	f

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CODE 004 **Math 101** **CODE 004**

Exam II (PART 1)
063
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1. By using the linearization of $f(x) = \sqrt{1+x}$, at $x = 0$, the approximate value of $\sqrt{\frac{3}{2}}$ is equal to

(a) $\frac{5}{4}$

(b) $\frac{3}{2}$

(c) $\frac{3}{4}$

(d) $\frac{7}{4}$

(e) 1

2. If $y = e^{x^2} \tan^3\left(3x + \frac{\pi}{4}\right)$, then $\left.\frac{dy}{dx}\right|_{x=0}$ equals

(a) 18

(b) 19

(c) 15

(d) 6

(e) 17

3. If $y = \sin^{-1}\left(\frac{1}{x^2}\right)$, then $\frac{dy}{dx} =$

(a) $\frac{x^2}{\sqrt{1-x^4}}$

(b) $\frac{x^2}{\sqrt{x^4-1}}$

(c) $\frac{-2x}{1+x^4}$

(d) $\frac{-2}{x\sqrt{x^4-1}}$

(e) $\frac{-2}{x\sqrt{1-x^4}}$

4. If $f(x) = \tanh^{-1}(\sinh x)$, then $f'(\ln 2) =$

(a) $\frac{16}{25}$

(b) $\frac{-4}{3}$

(c) $\frac{16}{7}$

(d) $\frac{20}{7}$

(e) $\frac{4}{5}$

5. If $f(x) = (x^6 + 1)^5(3x + 2)^3$, then $f'(0)$ equals

(a) 9

(b) 36

(c) -4

(d) -9

(e) 4

6. If $x^3 - y^3 = 8$, then $\dfrac{d^2y}{dx^2} =$

(a) $\dfrac{-16x}{y^5}$

(b) $\dfrac{2x - 2xy}{y^2}$

(c) $\dfrac{8x}{y^5}$

(d) $\dfrac{2xy^3 + 2x^4}{y^5}$

(e) $\dfrac{2x^4 - 2xy^3}{y^5}$

7. $\lim_{x \to 0} \dfrac{2 - 2\cos^2 3x}{x \tan x} =$

(a) 9

(b) 18

(c) 6

(d) 2

(e) $\dfrac{1}{9}$

8. If $f(x) = x^{x^2+2}$, then $f'(2)$ equals

(a) $(3 + 4 \ln 2)$

(b) $2^8 \ln 2$

(c) $2^8 6$

(d) $2^6(3 + 6 \ln 2)$

(e) $2^6(3 + 4 \ln 2)$

9. If $f(x) = \sqrt{x}\, g(\sqrt{x})$ and $g(1) = 2,\ g'(1) = 2,\ g''(1) = 4,$ then $f''(1)$ equals

(a) 3

(b) $\dfrac{31}{4}$

(c) 2

(d) 1

(e) $\dfrac{-1}{2}$

Name .....

ID ..... Sec .....

1	a	b	c	d	e	f
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67	a	b	c	d	e	f
68	a	b	c	d	e	f
69	a	b	c	d	e	f
70	a	b	c	d	e	f

ANSWER KEY

Q	MM	V1	V2	V3	V4
1	a	d	d	a	a
2	a	c	d	e	a
3	a	e	b	b	d
4	a	b	a	e	d
5	a	c	e	e	b
6	a	a	a	d	a
7	a	a	c	e	b
8	a	c	e	e	e
9	a	e	d	b	d

Answer Counts

V	a	b	c	d	e
1	1	1	2	2	3
2	1	3	1	3	1
3	2	3	3	0	1
4	2	2	0	3	2