MA2160 Final Exam, Part I May 7, 2003 Do all problems Show all work

Calculators are **not** allowed on Part I

Your Name:	ID:

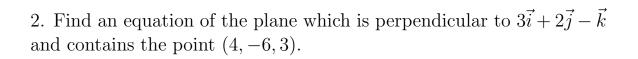
Please circle your section number.

Section	Instructor	Days & Times	Score (Part I)
R01	D. Pray	MWF 8 a.m.	$\overline{pg 1} = \underline{\hspace{1cm}} / 12$
R03	I. Kliakhandler	MWF 9 a.m.	pg 2 = / 12
R04	L. Young	MWF 9 a.m.	pg 3 = / 10
R05	B. Baartmans	MWF 10 a.m.	pg 4 = / 10
R06	C. Sarami	MWF 11 a.m.	pg 5 = / 9
R07	O. Paez Osuna	MWF 11 a.m.	pg 6 = / 8
R08	B. Bertram	MWF 12 p.m.	$total = \underline{\hspace{1cm}} / 61$
R09	G. Lewis	MWF 2 p.m.	TOTAL SCORE
R10	C. Gay	MWF 8 a.m.	Part $1 = _{} / 61$
R11	G. Lewis	MWF 3 p.m.	Part $2 = / 39$
R12	D. Olson	MWF 4 p.m.	$TOTAL = \underline{\hspace{1cm}} / 100$

Work on Part I first. It will be collected sometime during the middle of the exam period.

You may work on Part I of this exam at any time, but you must have handed in Part I before you may use your calculator on Part II.

1. Consider the vectors $\vec{u}=3\vec{i}+2\vec{j}-\vec{k}, \vec{v}=4\vec{i}-\vec{j}$ Find	$-8\vec{k}$, and $\vec{w} = 2\vec{i} - 2\vec{k}$.
(a) $\vec{u} \cdot \vec{v}$	
$\vec{u} \cdot \vec{v} = \underline{\hspace{1cm}}$ (b) $\vec{v} \times \vec{w}$	(2 points)
$\vec{v} \times \vec{w} = \underline{\hspace{1cm}}$ (c) A unit vector in the direction of \vec{u}	(3 points)
unit vector = (d) The component of \vec{v} in the direction of \vec{u}	(3 points)
component of \vec{v} in the direction of \vec{u}	(4 points)



equation of plane:______(4 points)

3. Evaluate the following integrals.

(a)
$$\int x\sqrt{x^2+4}\,dx$$

$$\int x\sqrt{x^2+4}\,dx = \underline{\hspace{1cm}} (4 \text{ points})$$
 (b)
$$\int x\sin x\,dx$$

$$\int x \sin x \, dx = \underline{\qquad} (4 \text{ points})$$

4. Find the partial fractions decomposition of the function $f(x) = \frac{x+4}{x^3-3x^2+2x}$. Do not integrate.

$$\frac{x+4}{x^3 - 3x^2 + 2x} =$$
 (4 points)

5. Evaluate $\int_0^1 x^2 e^{(x^3+1)} dx$ exactly.

$$\int_0^1 x^2 e^{(x^3+1)} dx =$$
 (6 points)

6.	Evaluate the improper	integral \int_2^{∞}	$\int \frac{1}{x^{3/2}} dx$ or show	that it diverges.	
		answer:		(5 points)	
_					
$7.$ e^{-}	Find the mass of a ro $^{x/10}$ gm/cm at a distant	od of length ce of x cm fr	20cm with mass rom the left end.	s density $\delta(x) =$ Include units.	
7. e ⁻	Find the mass of a re $^{x/10}$ gm/cm at a distant	od of length ce of x cm f	20cm with mass rom the left end.	s density $\delta(x) =$ Include units.	
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7. e	Find the mass of a re $^{x/10}$ gm/cm at a distant	od of length ce of x cm from	20cm with mass rom the left end.	s density $\delta(x) =$ Include units.	
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7. e	Find the mass of a ro $^{x/10}$ gm/cm at a distant	od of length ce of x cm f	20cm with mass rom the left end.	s density $\delta(x) =$ Include units.	

8.	Find the sum	of the geometric	series $12 - 6 + 3 -$	$-3/2 + 3/4 - \dots$
		_		, ,

9. Find the quadratic approximation (that is, the polynomial, $P_2(x)$) to $f(x) = 2^x$ about x = 0. Hint: $f'(x) = 2^x ln2$.

$$P_2(x) =$$
 (5 points)

10. Write the first four nonzero terms of the $\frac{1}{1-2x}$ about $x=0$.	Taylor Series expansion of
first four terms=	
of the differential equation $y'' + 4y = 0$.	
	(4 points)