GROUP NAME:	Student Names (First and Last)
Logo:	Speaker/Presenter: _____
Date: _____	Writer/Prep: _____
Topics:	QC/Leader: _____

Instructions:

Midterm #1

#1 $(0,12) \to (9,0)$ $(14,10) \to (2,1)$

$\langle 0,12\rangle + t\langle 9,-12\rangle$ $\langle 14,10\rangle + s\langle -12,-9\rangle$

$x = 9t$ $x = 14 - 12s$

$y = 12 - 12t$ $y = 10 - 9s$

$9t = 14 - 12s$

$12 - 12t = 10 - 9s$

$12 - 12\left(\frac{14-12s}{9_3}\right) = 10 - 9s$

$12 - \frac{56}{3} + 16s = 10 - 9s$

$25s = \frac{56}{3} - 2$

$s = \frac{2}{3}$

$9t = 14 - 12\left(\frac{2}{3}\right)$

$t = 6/9 = 2/3$

$|\langle 9,-12\rangle|$ $|\langle -12,-9\rangle|$

$\langle 9,-12\rangle \cdot \langle -12,-9\rangle = 0$

$\cos\theta = 90°$

GROUP NAME: Dougl Makes Logo:	Student Names (First and Last) Speaker/Presenter: Bagels
Date: Topics:	Writer/Prep: Alex QC/Leader: Paz

Instructions: Midterm #1 (wrong)

0, 12 14, 10 $x = -9(2/3) = 6 = 2+12(1/3) = y$

$+9, 0$ $-2, 1$ $x = 12+12(-2/3) = 4 = 1+9(1/3) = y$

crosses & Hits

$\langle 0,12\rangle + t(\langle +9,-12\rangle \langle 2,1\rangle - s\langle 12,9\rangle$

$x = -9t$ $x = 2+12s$ $x = t = \frac{2+12s}{-9}$

$y = 12+12t$ $y = 1+9s$

$y = 12+12\left(\frac{2+12s}{-9}\right) = 1+9s$

$x = -9t = 2+12\left(\frac{1}{3}\right)$

$12 + \frac{24}{-9} - \frac{144}{9}s = 1+9s$

$\frac{-9t}{-9} = \frac{2+4}{-9}$

Connect Magic!

$t = -2/3$ $s = 1/3$

$\cos^{-1}\left(\frac{\vec{v}\cdot\vec{w}}{|v|\cdot|w|}\right) = \theta$ $\frac{-9(12)+12(9)}{\sqrt{9^2+12^2}\ \sqrt{12^2+9^2}}$

~~225 225~~ $\cos^{-1}\left(\frac{0}{225}\right) = 90^\circ$

GROUP NAME: iDefine	Student Names (First and Last)
Logo:	Speaker/Presenter: Mike M.
Date: 5/8/2013	Writer/Prep: Kate M.
Topics:	QC/Leader: Joanna P.

Instructions: Midterm #2

(2) Find the equation of the plane that contains the points (1,0,0), (0,4,0), and (0,0,2)

$\vec{AB} = \langle -1, 4, 0 \rangle$ $\vec{AC} = \langle -1, 0, 2 \rangle$

$$\vec{AB} \times \vec{AC} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 4 & 0 \\ -1 & 0 & 2 \end{vmatrix} = \vec{i}\begin{vmatrix} 4 & 0 \\ 0 & 2 \end{vmatrix} - \vec{j}\begin{vmatrix} -1 & 0 \\ -1 & 2 \end{vmatrix} + \vec{k}\begin{vmatrix} -1 & 4 \\ -1 & 0 \end{vmatrix}$$

$$= 8\vec{i} + 2\vec{j} + 4\vec{k} = 0$$

$$= 8(x - x_0) + 2(y - y_0) + 4(z - z_0)$$

$$= 8(x-1) + 2(y-0) + 4(z-0)$$

$$= 8x - 8 + 2y + 4z = 0$$

$$8x + 2y + 4z = 8$$

$$\boxed{4x + y + 2z = 4}$$

2b) How far away is the origin from the plane?

$$d = \frac{|xn_1 - yn_2 - zn_3 - r|}{\sqrt{n_1^2 + n_2^2 + n_3^2}} = \frac{|0(4) - 0(1) - 0(2) - 4|}{\sqrt{4^2 + 1^2 + 2^2}} = \frac{4}{\sqrt{21}}$$

GROUP NAME: SEPS	Student Names (First and Last)
Logo:	Speaker/Presenter: William Carter
Date: 05/08/13	Writer/Prep: ZAHIN FARZANA
Topics:	QC/Leader:

Instructions: The p. car $\vec{r}(t) = 7\cos t\,\vec{i} + 7\sin t\,\vec{j} + 49t\,\vec{k}$ Midterm #3
Find dis. traveled; the position & the direction after 90sec

#3 $\vec{r}\,'(t) = -7\sin t\,\vec{i} + 7\cos t\,\vec{j} + 49\vec{k}$

direction:

$\vec{r}\,'(30) = -7\sin 30\,\vec{i} + 7\cos 30\,\vec{j} + 49\vec{k} = \langle -3.5, 6.06\ldots, 49\rangle$
$\langle 6.92, 1.08, 49\rangle$

Position:

$\vec{r}(30) = 7\cos(30)\,\vec{i} + 7\sin(30)\,\vec{j} + 49(3.0)\,\vec{k}$

$= 6.06\ldots\,\vec{i} + 3.5\,\vec{j} + 1470\,\vec{k}$

$= \langle 6.06, 3.5, 1470\rangle$
$\langle 6.08, -6.92, 1470\rangle$

Make sure calculator is in Radians

distance traveled:

$s(t) = \int_0^{30} |\vec{r}\,'(t)|\,dt = \int_0^{30} \sqrt{(-7\sin t)^2 + (7\cos t)^2 + (49)^2}\,dt$

$= \int_0^{30} \sqrt{49(\sin^2 t + \cos^2 t) + (49)^2}\,dt$

$= \int_0^{30} \sqrt{2450}\,dt = \sqrt{2450}\cdot(t)\Big|_0^{30} = \sqrt{2450}\cdot 30$

$= 296.98\ldots$

$30\cdot\sqrt{2450}$ 1484.92

GROUP NAME: Mechanica Engineum.	Student Names (First and Last)
Logo:	Speaker/Presenter: Jesus D
Date: 8/5/2013	Writer/Prep: Nick Chiovari
Topics:	QC/Leader: Renzo Changanaqui

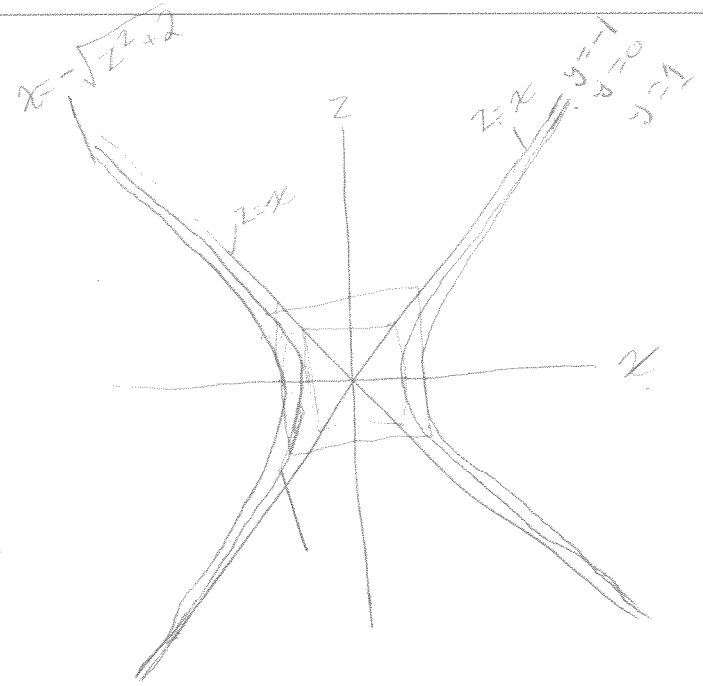
Instructions: Draw and level curves for $y=-1,0,1$. Describe the shape.

(4) $x^2-y-z^2=1$

Midterm #4

$y=-1$ $x^2+1-z^2=1$

$x^2-z^2=0$



$y=0$ $x^2-z^2=1$

$\sqrt{x^2}=\pm\sqrt{z^2+1}$

$x=\pm\sqrt{z^2+1}$

$y=1$ $x^2-1-z^2=1$

$x^2-z^2=2$

$\sqrt{x^2}=\sqrt{z^2+2}$

$x=\pm\sqrt{z^2+2}$

$\frac{x^2}{\sqrt{2}}-\frac{z^2}{\sqrt{2}}=1$

hyperbolic paraboloid

GROUP NAME: Engineers Logo:	Student Names (First and Last) Speaker/Presenter: _____
Date: _____ Topics:	Writer/Prep: _____ QC/Leader: _____

Instructions: Midterm #5

#5

$f(x,y) = 400 + 3x^2 - 6xy - y^3$ $(-2,2)$ $(0,0)$

$f_x = 6x - 6y$ $x = y$ $f_{xx} = 6$ $f_{xy} = -6$

$f_y = -6x - 3y^2$ $f_{yy} = -6y$

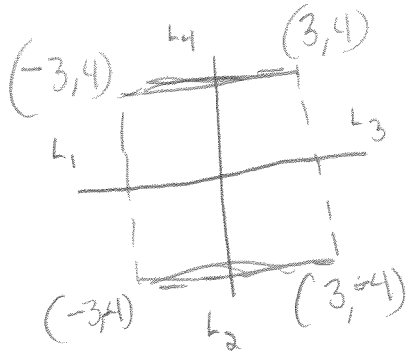
$D = f_{xx}(a,b) f_{yy}(a,b) - f_{xy}(a,b) = 0$

$D(0,0) = -36$ $f_{xx}(0,0) = 6$

$D(-2,-2) = 36$ $f_{xx} = 6$

$-4 < y < 4$

$-3 < x < 3$



$(-3,-4)$ $f(x,y) = 400 + 3x^2 - 6xy - y^3$

L_1 $f(-3,y) = 400 + 27 + 18y - y^3$

L_2 $f(x,-4) = 400 + 3x^2 + 24x + 64$ ON $(-3,3)$

L_3 $f(3,y) =$

L_4 $f(x,4) = 400 + 3x^2 - 24x - 64$ ON $(-3,3)$

$(3,-4) = 563$

$(3,4) = 291$ minimum

$(-2,-2) = 396$

$(0,0) = 400$ saddle

$(-3,\sqrt{6}) = 456.39$

GROUP NAME: The Daughmaters	Student Names (First and Last)
Logo:	Speaker/Presenter: Patricia
Date:	Writer/Prep: Alana
Topics: Midterm	QC/Leader: Bagels

Instructions: #6 If the height of a roof is given by $f(x,y) = 400 + 3x^2 - 6xy - y^3$
a) Find the value of the greatest slope at the point (3,5)
b) Find the directional derivative from the point (3,5) towards the point (0,0)

a) $F_x = 6x - 6y = 6(3) - 6(5) = -12$

$F_y = -6x - 3y^2 = -6(3) - 3(5)^2 = -93$

$|\langle F_x, F_y \rangle| = \sqrt{12^2 + 93^2} = \sqrt{8793} \approx 93.77$

b) $\vec{u} \cdot \nabla f \qquad D_u = \nabla f \cdot u$

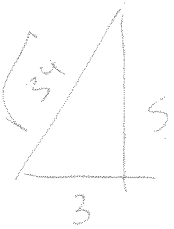
$\nabla f = \langle 6x - 6y, -6x - 3y^2 \rangle$

$\vec{u} = \dfrac{\vec{AB}}{\|\vec{AB}\|}$ $\quad A = (3,5)$ $\quad B = (0,0)$ $\quad \vec{AB} = \langle -3, -5 \rangle$

$= \dfrac{\langle -3, -5 \rangle}{\|\langle -3, -5 \rangle\|}$

$= \dfrac{\langle -3, -5 \rangle}{\sqrt{3^2 + 5^2}}$

$= \left\langle \dfrac{-3}{\sqrt{34}}, \dfrac{-5}{\sqrt{34}} \right\rangle$ ✓



$\vec{u} \cdot \nabla F = \left\langle \dfrac{-3}{\sqrt{34}}, \dfrac{-5}{\sqrt{34}} \right\rangle \cdot \langle 6(3) - 6(5), -6(3) - 3(5)^2 \rangle$

$\cdot \langle -12, -93 \rangle$

$= \dfrac{-3}{\sqrt{34}}(-12) + \dfrac{-5}{\sqrt{34}}(-93) \approx 85.92$

GROUP NAME: Comp Sci	Student Names (First and Last)
Logo:	Speaker/Presenter: Eric Zhuang
Date: 5/9/13	Writer/Prep: Konah Hall
Topics:	QC/Leader:

Instructions: Midterm #7: If the $f(x,y) = \frac{2x+7y^2}{7x^2-2y} + 100$, find the limit as $(x,y) \to (0,0)$ along the paths $x=0$.

7) $f(x,y) = \frac{2x-7y^2}{7x^2-2y} + 100$ $(x,y) \to 0,0)$ path $x=0$

$x=0$

$\lim_{x \to 0} \frac{2x-7y^2}{7x^2-2y} = \frac{-7y^2}{-2y} = \frac{7y}{2}$ $\lim_{x \to 0} \frac{7y}{2} = 0 + 100 = 100$

and $y=x$

$\lim_{y \to x} \frac{2x-7y^2}{7x^2-2y} = \frac{2y-7y^2}{7y^2-2y} = \frac{-(7y^2-2y)}{7y^2-2y} = -1 + 100 = 99$

(b) Continuous at (0,0)? No - undefined limit at (0,0).

Different limits

GROUP NAME: Compsci Logo:	Student Names (First and Last) Speaker/Presenter: Eric Zhuang
Date: 5/8 Topics:	Writer/Prep: QC/Leader: Konah HALL

Instructions: Midterm #8

$V = \pi r^2 h$

$\frac{\partial V}{\partial r} = \pi 2rh\,dr$

$\frac{\partial V}{\partial h} = \pi r^2\,dh$

$dV = \frac{\partial V}{\partial r}dr + \frac{\partial V}{\partial h}dh$

$= \pi 2rh\,dr + \pi r^2\,dh$

$= \pi(2)(5\text{cm})(10\text{cm})(\pm .07\text{cm}) + \pi(5\text{cm})^2(\pm .103\text{cm})$

$= \pm 21.99\text{cm}^3 \pm 2.36\text{cm}^3$

$= 24.35\text{cm}^3$

GROUP NAME: Engineers

Logo: X

Student Names (First and Last)

Speaker/Presenter: Rhombus Rod

Writer/Prep: Kyle G

Date: Sorry

Topics: We've Got 2 Problems

QC/Leader: Charlie N

Instructions: Evaluate the integral #9
Identify the Region

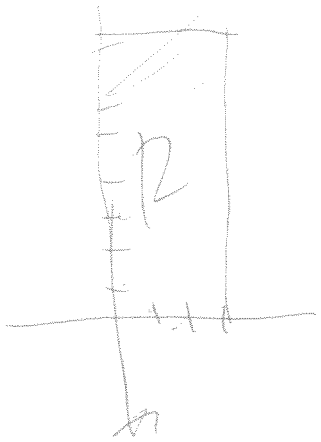
$$\int_0^3 \int_0^7 10y \, dy \, dx$$

$$\int_0^3 5y^2 \, dx \Big|_0^7$$

$$\int_0^3 245 \, dx$$

$$245x \Big|_0^3$$

735



Region $0 \le y \le 7$

$0 \le x \le 3$

GROUP NAME: (Derive	Student Names (First and Last)
Logo:	Speaker/Presenter: Michael M.
Date: 5-8-13	Writer/Prep: Kate M.
Topics:	QC/Leader: Joanna P.

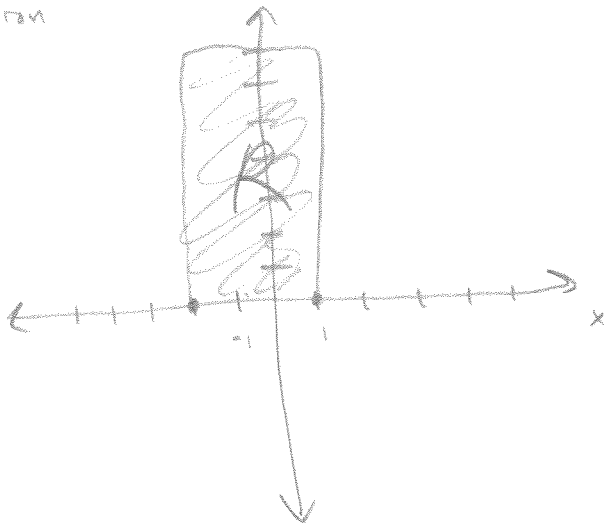
Instructions: Midterm #10

Evaluate integral over $R = \{(x,y): -2 \le x \le 1, 0 \le y \le 7\}$

$$\int_R \int (x^2+4xy)\,dA = \int_{-2}^{1}\int_{0}^{7} x^2+4xy\,dy\,dx = \int_{-2}^{1}\left[x^2y+2xy^2\Big|_0^7\right]dx = \int_{-2}^{1} 7x^2+98x\,dx$$

$$= \frac{7}{3}x^3+49x^2\Big|_{-2}^{1} = \left(\frac{7}{3}+49\right)-\left(\frac{-56}{3}+196\right) = -126$$

Draw the region



GROUP NAME: Engees	Student Names (First and Last)
Logo:	Speaker/Presenter:
Date: 5/8/13	Writer/Prep: Brendan Feldman
Topics: partial derivatives	QC/Leader: Felipe

Instructions: Midterm #11

$$\frac{\partial g}{\partial x} = y5^{2x}\ln(5) = (3u-v)5^{2(5u+2v)}\ln(5)$$

$$\frac{\partial g}{\partial x} = (3u-v)5^{10u+4v}\ln(5)$$

$$\frac{\partial g}{\partial y} = 5^{10u+4v} \qquad \frac{\partial y}{\partial u} = 3$$

$$\frac{\partial x}{\partial u} = 5$$

$$\frac{\partial g}{\partial u} = \frac{\partial g}{\partial x}\frac{\partial x}{\partial u} + \frac{\partial g}{\partial y}\frac{\partial y}{\partial u}$$

$$= \left((3u-v)5^{10u+4v}\ln(5)\right)(5) + \left(5^{10u+4v}\right)(3)$$

$$= 5(3u-v)5^{10u+4v}\ln(5) + 3\cdot 5^{10u+4v}$$

$$= 5^{10u+4v}\left((15u-5v)\ln(5) + 3\right)$$

$$\frac{\partial}{\partial x}a^x = a^x\ln a \qquad \frac{\partial g}{\partial x} = y5^{2x}\cdot 2 \qquad (3u-v)5^{10u+4v}\cdot 2\ln$$

GROUP NAME: Engees	Student Names (First and Last)
Logo:	Speaker/Presenter:
Date: 5/8	Writer/Prep: Felipe
Topics:	QC/Leader: Bendan

Instructions: Midterm # 2

a) $\frac{5x^2}{16} - \frac{y^2}{4.4} - \frac{7\pi z^2}{4} = 0$

Cone. Elliptic ✓

b) $\frac{a^2}{16} - \frac{b}{9} - \frac{c^2}{4} = 0$

Hyperbolic Paraboloid.

$c=0$ ↘
$a^2=b$
$a=0$ ↗
$b=c$

c) $\frac{-\alpha^2}{16} + \frac{\beta^2}{9} - \frac{\gamma^2}{4} = -1$

$\frac{\alpha^2}{16} - \frac{\beta^2}{9} + \frac{\gamma^2}{4} = 1$

Hyperboloid 1-Sheet