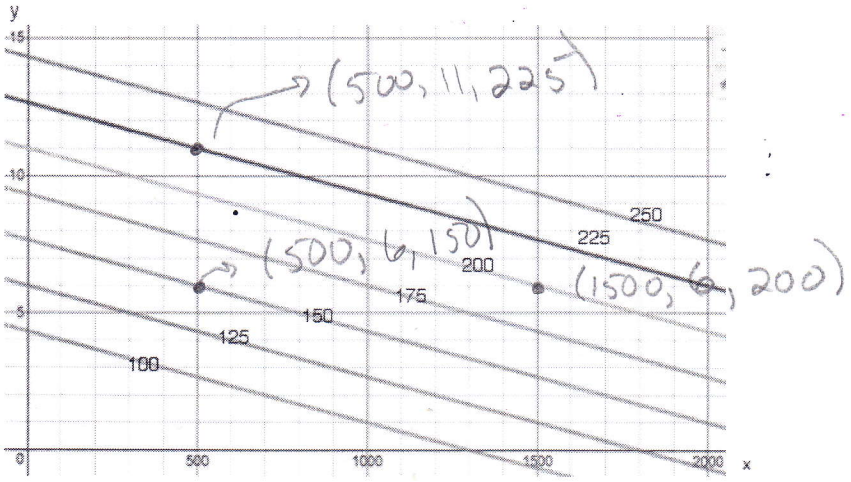
Mac 2313 Quiz 2 Name Delve
Calculus III

1. The contour diagram below is for a function C(x,y) where C is the charge in dollars to use an internet service.The variable y is the number of months of use and x is the total number of minutes online.



A) Write the equation for this linear function. Show all your work in calculating the slopes including the 3D coordinates of the points you used for each slope calculation.

$m_x = \frac{200-150}{1500-500} = \frac{50}{1000} = .05$ $\quad m_y = \frac{225-150}{11-6} = \frac{75}{5} = 15$

$C = .05x + 15y + D$ sub in point

$225 = .05(500) + 15(11) + D$

$D = 35$

$C = .05x + 15y + 35$

B) The units for the slope in the x – direction are $/min and the units for the slope in the y-direction are $/month.

2. Find the angle between the two vectors: $\vec{v} = 3\hat{i} - 2\hat{j}$ and $\vec{w} = 4\hat{i} + 3\hat{j} - 2\hat{k}$. Show all your work. Give ans. in degrees 9 4 16 9 1-4

$\vec{v} \cdot \vec{w} = \|\vec{v}\| \|\vec{w}\| \cos(\theta)$

$12 - 6 = \sqrt{13}\sqrt{29}\cos(\theta)$

$\frac{6}{\sqrt{13}\sqrt{29}} = \cos(\theta)$

$\theta = \cos^{-1}\left(\frac{6}{\sqrt{13}\sqrt{29}}\right) = 72°$