

Fingl Spring 2001 241

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PRINT Your Name: _____

Get your course grade from TIPS/VIP late on Thursday or later.

There are 19 problems on 10 pages. Problems 1 and 2 are worth 7 points each. Each of the other problems is worth 8 points. The exam is worth a total of 150 points. SHOW your work. **CIRCLE** your answer. NO CALCULATORS!

1. (There is no partial credit for this problem. Make sure your answer is correct.) Find the equation of the plane through $(1, 1, 1)$, $(1, 2, -2)$, and $(3, 1, -3)$.

$$\vec{PQ} \times \vec{PR} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 0 & 1 & -3 \\ 2 & 0 & -4 \end{vmatrix} = -4\vec{i} - 6\vec{j} - 2\vec{k}$$

$$-4(x-1) - 6(y-1) - 2(z-1) = 0$$

$$2(x-1) + 3(y-1) + 1(z-1) = 0$$

$$2x + 3y + z = 6$$

check $2+3+1=6$

$$2+6-2=6$$

$$6+3-3=6$$

2. (There is no partial credit for this problem. Make sure your answer is correct.) Find the equations of the line through $(1, 3, 4)$ and $(3, 6, 9)$.

$$\vec{PQ} = 2\vec{i} + 3\vec{j} + 5\vec{k}$$

$$\vec{P} \quad \vec{Q}$$

$$\begin{cases} x = 1 + 2t \\ y = 3 + 3t \\ z = 4 + 5t \end{cases}$$