

Final 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 $(3, 1, -3)$. $P =$ $Q =$

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

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

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

$$\boxed{2x + 3y + z = 6}$$

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 $(3, 6, 9)$. $P =$ $Q =$

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

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