241

PRINT Your Name:_____

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

There are 17 problems on 9 pages. Problems 1, 2, and 7 are each worth 8 points. Each of the other problems is worth 9 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 $(2,2,3)$, $(2,0,2)$, and $(5,1,1)$.

P Q R

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

$3(x-2) - 3(y-0) + 6(z-2) = 0$

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

$x - y + 2z = 6$

Ch: $2 - 2 + 6 = 6$ ✓

$2 + 4 = 6$ ✓

$5 - 1 + 2 = 6$ ✓

2. **(There is no partial credit for this problem. Make sure your answer is correct.)** Find the equations of the line through $(6,4,2)$ and $(3,4,7)$.

P Q

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

$x = 6 - 3t$

$y = 4$

$z = 2 + 5t$

at $t=0$ the line is $(6,4,2)$ ✓

at $t=1$ the line is $(3,4,7)$ ✓