Name $\qquad$ Date $\qquad$
Instructions: Please show all of your work as partial credit will be given where appropriate, and there may be no credit given for problems where there is no work shown. All answers should be completely simplified, unless otherwise stated.

1. If $\boldsymbol{a}=\langle 3,3,1\rangle, \boldsymbol{b}=\langle-2,-1,0\rangle$ and $\boldsymbol{c}=\langle-2,-3,-1\rangle$,
(a) find $\boldsymbol{a} \times(\boldsymbol{b}+\boldsymbol{c})$.
(b) find $\boldsymbol{a} \cdot(\boldsymbol{b} \times \boldsymbol{c})$

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\boldsymbol{a} \times(\boldsymbol{b}+\boldsymbol{c})=
$$

$\qquad$

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\boldsymbol{a} \cdot(\boldsymbol{b} \times \boldsymbol{c})=
$$

2. Find the equation of the plane passing through $\mathrm{P}(4,-2,1)$ and perpendicular to $\boldsymbol{n}=2 \boldsymbol{i}-5 \boldsymbol{j}+3 \boldsymbol{k}$.

Plane: $\qquad$
3. Find the distance between the parallel planes $5 x-3 y-2 z=5$ and $-5 x+3 y+2 z=7$.
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