1. Find the cross product $a \times b$ and verify that it is orthogonal to both a and b .

$$
a=\mathrm{i}+3 \mathrm{j}-2 \mathrm{k}, b=-\mathrm{i}+5 \mathrm{k}
$$

2. For the three points $\mathrm{P}(1,4,6), \mathrm{Q}(-2,5,-1)$ and $\mathrm{R}(1,-1,1)$, answer the following. (a) Find a unit vector normal to the plane spanned by the three points above.
(b) Find the area of a triangle with three points above.
3. Are the following three vectors coplanar? In other words, are they in the same plane? $a=\langle 6,3,-1\rangle, b=\langle 0,1,2\rangle, c=\langle 4,-2,5\rangle$
