

Show all work. 5 points each.

1. Let  $\mathbf{a} = \langle 3, -1 \rangle$  and  $\mathbf{b} = \langle -2, 4 \rangle$ :

(i) Find  $|\mathbf{a}|$ .

(ii) Find  $\mathbf{a} + \mathbf{b}$  and illustrate geometrically along with  $\mathbf{a}$  and  $\mathbf{b}$ .

2. (i) Find  $proj_{\mathbf{a}}\mathbf{b}$  if  $\mathbf{a} = \langle 4, 2, 0 \rangle$  and  $\mathbf{b} = \langle 1, 1, 1 \rangle$ .

(ii) Which vector(s), ( $\mathbf{a}$ ,  $\mathbf{b}$ , both, neither ) is the result in 2.(i) parallel to?