MATH 261 Quiz 1 Name: .
Student number:

Show all work. 5 points each.

1. Let $\mathbf{a} = \langle 5, -12 \rangle$ and $\mathbf{b} = \langle -3, -6 \rangle$:

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

(ii) Find $\mathbf{a} + \mathbf{b}$ and illustrate the associated triangle (or parallelogram) formed by $\mathbf{a} + \mathbf{b}$, $\mathbf{a}$ and $\mathbf{b}$.

2. (i) Find $orth_{\mathbf{a}}\mathbf{b} = \mathbf{b} - \dfrac{\mathbf{a} \cdot \mathbf{b}}{|\mathbf{a}|^{\mathbf{2}}}\mathbf{a}$ if $\mathbf{a} = \langle 5, 0 \rangle$ and $\mathbf{b} = \langle 3, 4 \rangle$. **Again: Show all work.**

(1pt Extra credit) What is the area of the parallelogram formed by $\mathbf{a} + \mathbf{b}$, $\mathbf{a}$ and $\mathbf{b}$ from problem 2 ?