Section 12.1: Vectors in Two Dimensions

Warm up:

Problem 1 *Sketch the vectors* $\mathbf{u} = \langle 1, -1 \rangle$ *and* $\mathbf{v} = \langle 2, 0 \rangle$. *Now using your sketch of these vectors, sketch* $\mathbf{u} - 2\mathbf{v}$.

Group work:

Problem 2 *Suppose that* $\mathbf{u} = \langle 5, -1 \rangle$ *and* $\mathbf{v} = \langle 2, 3 \rangle$. *Find the following quantities:*

(a) $-\mathbf{v}$

(b) $3\mathbf{u} - 4\mathbf{v}$

(c) $|\mathbf{u}|$

Problem 3 *Suppose that* $\mathbf{u} = 3\mathbf{i} - 4\mathbf{j}$ *in a 2-dimensional vector space. Find the following:*

(a) *A unit vector in the same direction of* $\mathbf{u}$.

(b) *All unit vectors parallel to* $\mathbf{u}$. *(How does differ from part (a)?)*

(c) *Two vectors parallel to* $\mathbf{u}$ *with length 10.*

(d) *Two non-zero vectors perpendicular to* $\mathbf{u}$.