

Homework #84

Answers

From Houghton-Mifflin Precalculus

3rd Edition

p454:

$$45) \mathbf{v} = \mathbf{u} + 2\mathbf{w} = (2\mathbf{i} - \mathbf{j}) + 2(\mathbf{i} + 2\mathbf{j}) = 4\mathbf{i} + 3\mathbf{j} = \langle 4, 3 \rangle$$

$$46) \mathbf{v} = -\mathbf{u} + \mathbf{w} = -(2\mathbf{i} - \mathbf{j}) + (\mathbf{i} + 2\mathbf{j}) = -\mathbf{i} + 3\mathbf{j} = \langle -1, 3 \rangle$$

$$50) \mathbf{v} = 8(\cos 135^\circ \mathbf{i}, \sin 135^\circ \mathbf{j}): \text{ magnitude} = 8 \quad \text{direction angle} = 135^\circ$$

$$51) \mathbf{v} = 6\mathbf{i} - 6\mathbf{j} : \tan \theta = -6/6 = -1, \text{ Quadrant IV: } \theta = 360^\circ - 45^\circ = 315^\circ$$

$$\|\mathbf{v}\| = \sqrt{36 + 36} = 6\sqrt{2}$$

$$56) \|\mathbf{v}\| = 1, \theta = 45^\circ:$$

$$\mathbf{v} = 1\langle \cos 45^\circ, \sin 45^\circ \rangle = \langle \sqrt{2}/2, \sqrt{2}/2 \rangle$$

$$57) \|\mathbf{v}\| = 3\sqrt{2}, \theta = 150^\circ:$$

$$\begin{aligned} \mathbf{v} &= 3\sqrt{2}\langle \cos 150^\circ, \sin 150^\circ \rangle = \langle (3\sqrt{2})(-\sqrt{3}/2), (3\sqrt{2})(\frac{1}{2}) \rangle \\ &= \langle -3\sqrt{6}/2, 3\sqrt{2}/2 \rangle \end{aligned}$$

$$59) \|\mathbf{v}\| = 2, \mathbf{v} \text{ direction: } \mathbf{i} + 3\mathbf{j} :$$

$$\tan \theta = 3/1 \quad \theta = 71.57^\circ$$

$$\begin{aligned} \mathbf{v} &= 2\langle \cos 71.57^\circ, \sin 71.57^\circ \rangle = \langle (2)(.3165), (2)(.9487) \rangle \\ &= \langle 0.632, 1.897 \rangle \end{aligned}$$