

Math 112: Quiz 9.1:

+1 1.  $\mathbf{u} = \langle 2, 3 \rangle$   $\mathbf{v} = \langle 1, 4 \rangle$  Find  $2\mathbf{u} - 3\mathbf{v}$

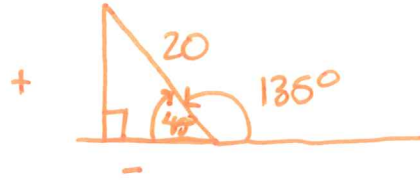
$$2\mathbf{u} = \langle 4, 6 \rangle$$

$$3\mathbf{v} = \langle 3, 12 \rangle$$

$$2\mathbf{u} - 3\mathbf{v} = \langle 1, -6 \rangle$$

+2 2. Find the horizontal and vertical components of the vector with the given length and direction. Write the vector in component form:  $\langle a, b \rangle$

$$|\mathbf{w}| = 20 \quad \theta = 135^\circ$$



$$\mathbf{w} = \langle -10\sqrt{2}, 10\sqrt{2} \rangle$$

$$a = 20 \cdot \cos 45^\circ = -10\sqrt{2}$$

$$b = 20 \cdot \sin 45^\circ = 10\sqrt{2}$$

+2 3. Find the magnitude and direction (in degrees) of the vector  $\mathbf{v}$ ,

$$\mathbf{v} = 5\mathbf{i} - 12\mathbf{j}$$

$$|\mathbf{v}| = \sqrt{5^2 + (-12)^2} = 13$$

$$\theta = \tan^{-1}\left(\frac{-12}{5}\right) = -67.38^\circ$$

$$\theta = 292.62^\circ$$

$$360 - 67.38^\circ = 292.62^\circ$$