Example #3a p. 2 Ch. 9

Write u in terms of <a, b> if

|u | = 8 and θ = 135°

Notice the reference ∠ & Quadrant

- 135° is a 45° angle in QII where

    sine is positive $\sin 45° = {}^{\sqrt{2}}\!/_{2}$

        &

    cosine is negative $\cos 45° = {}^{-\sqrt{2}}\!/_{2}$
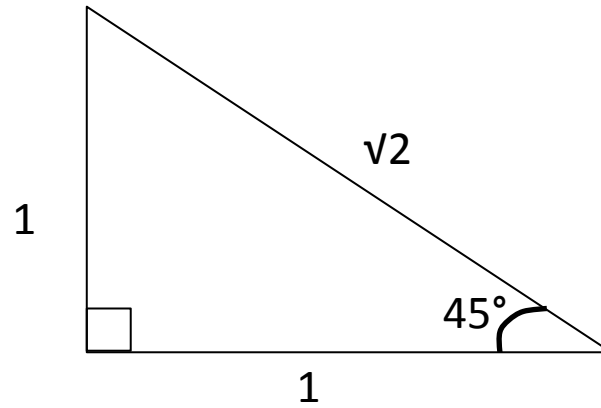
Find the horizontal component
|u | = 8 and θ = 135°

- The horizontal component is the x component which is given by   a = |u| cos θ

$$a = 8 \cdot -\frac{\sqrt{2}}{2} = -4\sqrt{2}$$

Find the vertical component
|u | = 8 and θ = 135°

- The vertical component is the y component which is given by $b = |u| \sin \theta$

$$b = 8 \cdot \frac{\sqrt{2}}{2} = 4\sqrt{2}$$

Thus, u is

u = $\langle -4\sqrt{2}, 4\sqrt{2} \rangle$

Notice: The vector would have been $\langle -\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \rangle$ if the magnitude were 1 and this is 8 times that vector!