A tank is supported by two cables, attached at point A, and oriented as shown in the figure. If the tension in cable AB is known to be 300 lb and the tension in cable AC is known to be twice as much as cable AB:
1. (5 points) With reference to the coordinate system given, express the tension force in cable AB in its Cartesian vector form (i.e. in terms of scalar components and unit vectors).

\[ T_{AB} = -240 \hat{u} + 180 \hat{v} \text{ LB} \]

Please place your final answer in the box below. Your answer should include the appropriate units.
2. (10 points) Draw a Free Body Diagram of point A in the box below. For full credit, show all known and unknown forces and clearly indicate the directions of each force.
3. (5 points) If the tank is in equilibrium, find the angle that cable AC makes with the y axis in degrees.

\[ \sum F_x = 0 \]

\[-240 \text{ lb} + 600 \text{ lb} \sin \theta = 0 \]

\[ \sin \theta = \frac{240}{600} = 0.4 \]

\[ \theta = 23.58^\circ \]

Please place your final answer in the box below. Your answer should include the appropriate units (degrees).

\[ \theta = 23.58^\circ \]
4. (5 points) If the tank is in equilibrium, find the weight of the tank.

\[ +\Sigma F_y = 0 \]
\[ 180 \text{ lbs} + 600 \cos \theta - W = 0 \]
\[
W = 180 + 600 \cos 23.58^\circ \\
W = 180 + 549.9 \\
W = 729.9 \text{ lb}
\]

Please place your final answer in the box below. Your answer should include the appropriate units.

\[
W = 729.9 \text{ lb}
\]