\[ F_z^3 = - (F_x^1 + F_x^2) = -(0.098 + 0.067) = -0.165 \text{ N} \]
\[ F_y^3 = - (F_y^1 + F_y^2) = -(0 + 0.184) = -0.184 \text{ N} \]

(d) (3 pts) Find the magnitude of \( F^3 \). Show your work and use proper units.
\[
\| F^3 \| = \sqrt{(F_x^3)^2 + (F_y^3)^2} = \sqrt{(-0.165)^2 + (-0.184)^2}
\]
\[
= \sqrt{0.061} = 0.247 \text{ Newtons}
\]

(e) (3 pts) What mass must be hanging from string 3? Show your work and use proper units.
\[
m^3 = \frac{\| F^3 \|}{g} = \frac{0.247}{9.8} = 0.025 \text{ kg} = 25 \text{ grams}
\]

(f) (6 pts) At what angular marking does string 3 cross the edge of the table? Do not necessarily believe the drawing. Show your work and give your answer in degrees.
\[
\theta^3 = 228.1^\circ
\]

\[
F_x^3 = \| F^3 \| \cos \theta^3 \Rightarrow -0.165 = 0.247 \cos \theta^3
\]
\[
F_y^3 = \| F^3 \| \sin \theta^3 \Rightarrow -0.184 = 0.247 \sin \theta^3
\]
\[
\Rightarrow \tan \theta^3 = \frac{0.184}{0.165} \Rightarrow \theta^3 = 48.12^\circ \text{ or } 188.12 + 180^\circ
\]