Answer on Question #47251-Physics, Other

A wizard levitates himself to a pair of magical connections to points on the ceiling. He has $T = 6.00 \cdot 10^2 \, N$ of tension in each connection, and the connections make angles of 45 degrees and 32 degrees with the ceiling. Assuming the arrangement balances him perfectly, what is the wizards mass?

Solution

Assuming the arrangement balances him perfectly

$$W - T\sin 45 - T\sin 32 = 0 \rightarrow m = \frac{W}{g} = \frac{T(\sin 45 + \sin 32)}{g} = \frac{6.00 \cdot 10^2 (\sin 45 + \sin 32)}{9.81} = 75.66 \, kg.$$

Answer: $75.66 \, kg$.