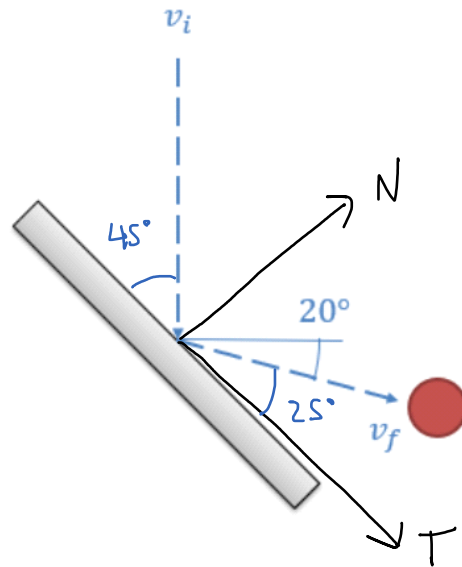


## Problem 2

A bounce test is used to sort ripe cranberries from unripe cranberries. In this test cranberries are dropped vertically onto a steel plate sitting at a 45 degree angle. After the impact, a cranberry is observed to bounce off at an angle of 20 degrees below horizontal. Based on this information, what is the coefficient of restitution for the cranberry?



$$V_{ti} = V_{tf}$$

$$V_i \cos(45) = V_f \cos(25)$$

$$V_i = \frac{V_f \cos(25)}{\cos(45)}$$

$$e = -\frac{V_{nf}}{V_{ni}} = -\frac{V_f \sin(25)}{-V_i \sin(45)}$$

$$e = -\frac{\cancel{V_f} \sin(25)}{-\left(\frac{\cancel{V_f} \cos(25)}{\cos(45)}\right) \sin(45)} = \frac{\sin(25)}{\cos(25)} = \boxed{.466}$$