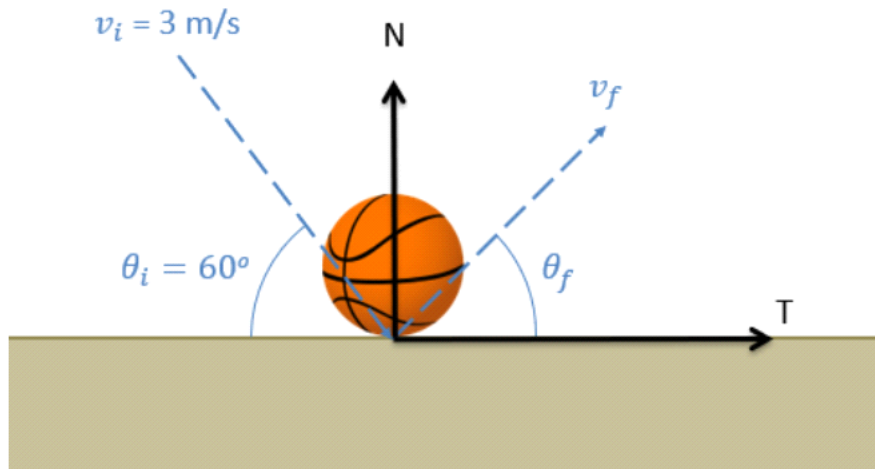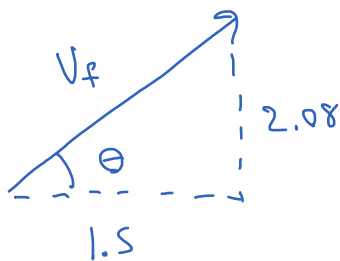# Problem 1

A basketball with an initial speed of 3 meters per second impacts a hard floor at the sixty degree angle as shown below. If the collision has a coefficient of restitution of .8, what is the expected speed and angle of the basketball after the impact?

$$V_{tf} = V_{ti} = 3 \cos(60) = 1.5$$

$$V_{Nf} = -e(V_{Ni}) = -.8(-3 \sin(60)) = 2.08$$

$$V_f = \sqrt{1.5^2 + 2.08^2} = \boxed{2.56 \text{ m/s}}$$

$$\theta = \tan^{-1}\left(\frac{2.08}{1.5}\right) = \boxed{54.2°}$$