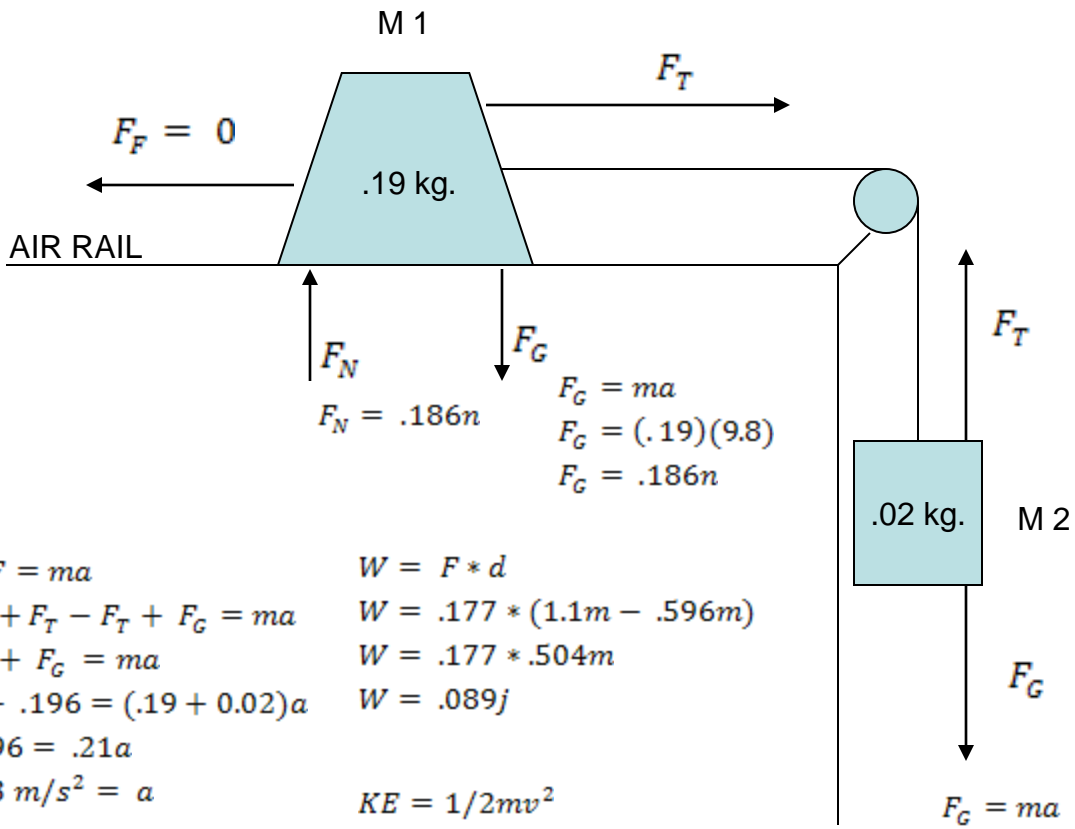


Frictionless system



$$\sum F = ma$$

$$F_F + F_T - F_T + F_G = ma$$

$$F_F + F_G = ma$$

$$0 + .196 = (.19 + 0.02)a$$

$$.196 = .21a$$

$$.93 \text{ m/s}^2 = a$$

$$v = \frac{x}{t}$$

$$v = \frac{0.1 \text{ m}}{.105 \text{ s}}$$

$$v = .95 \text{ m/s}^2$$

$$W = F * d$$

$$W = .177 * (1.1 \text{ m} - .596 \text{ m})$$

$$W = .177 * .504 \text{ m}$$

$$W = .089 \text{ J}$$

$$KE = 1/2 mv^2$$

$$KE = 1/2 (.19)(.95)^2$$

$$KE = 1/2 (.19)(.90)$$

$$KE = .086 \text{ J}$$

$$F_G = ma$$

$$F_G = (.19)(9.8)$$

$$F_G = .186 \text{ N}$$

$$\sum F = ma$$

$$-F_T + F_G = ma$$

$$-F_T + .196 = .02 \times .93$$

$$-F_T + .196 = .0186$$

$$-F_T = -.177$$

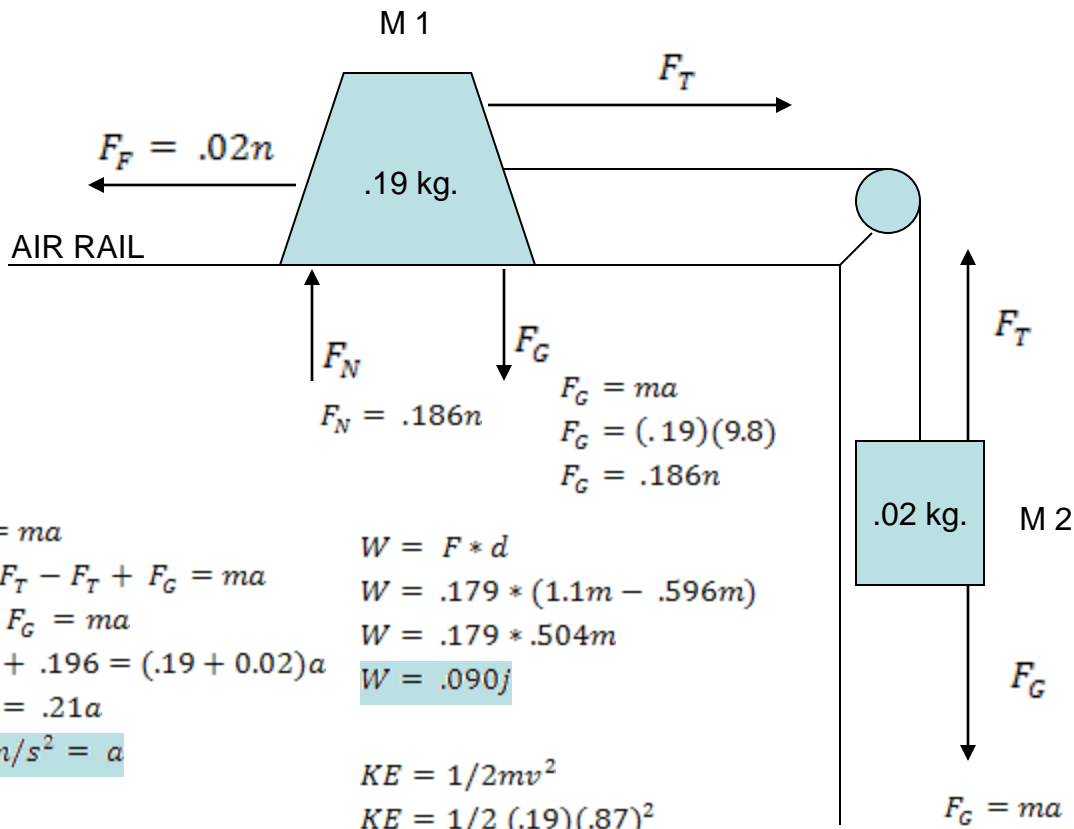
$$F_T = .177$$

$$PE = mgy$$

$$PE = (.02)((9.8)(.504))$$

$$PE = .099 \text{ J}$$

Friction Added



$$\sum F = ma$$

$$F_F + F_T - F_T + F_G = ma$$

$$F_F + F_G = ma$$

$$-.02 + .196 = (.19 + 0.02)a$$

$$.176 = .21a$$

$$.84 \text{ m/s}^2 = a$$

$$v = \frac{x}{t}$$

$$v = \frac{0.1 \text{ m}}{.115 \text{ s}}$$

$$v = .87 \text{ m/s}^2$$

$$.115 \text{ s} = \text{guess}$$

$$W = F * d$$

$$W = .179 * (1.1 \text{ m} - .596 \text{ m})$$

$$W = .179 * .504 \text{ m}$$

$$W = .090 \text{ J}$$

$$KE = 1/2 mv^2$$

$$KE = 1/2 (.19)(.87)^2$$

$$KE = 1/2 (.19)(.76)$$

$$KE = .072 \text{ J}$$

$$F_G = ma$$

$$F_G = (.19)(9.8)$$

$$F_G = .186 \text{ n}$$

$$\sum F = ma$$

$$-F_T + F_G = ma$$

$$-F_T + .196 = .02 \times .84$$

$$-F_T + .196 = .0168$$

$$-F_T = -.179$$

$$F_T = .179$$

$$PE = mgy$$

$$PE = (.02)((9.8)(.504))$$

$$PE = .099 \text{ J}$$