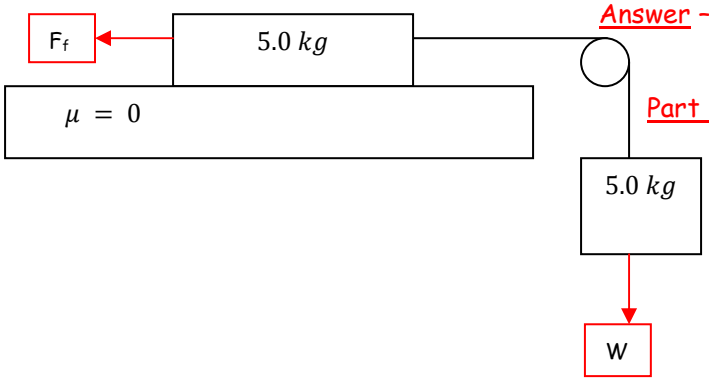
KEY

Tension!!!

Name - _____

Find the tension in each diagram below.



Answer - Part 1 - $\vec{F}_f = \mu\vec{F}n \quad \vec{F}_f = (0)(-9.81)(5.0) \quad \vec{F}_f = 0\ N$

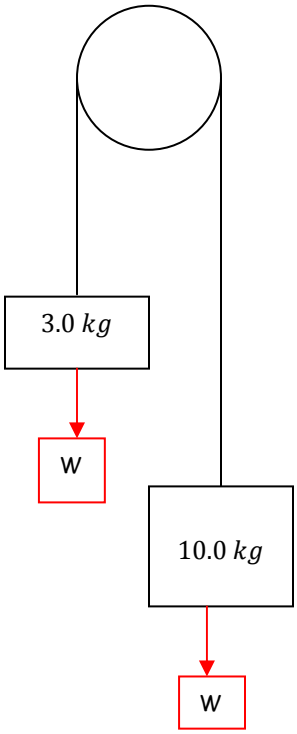
$\vec{F}_g = mg \quad \vec{F}_g = (5.0)(-9.81) \quad \vec{F}_g = -49.05\ N$

Part 2 - $\vec{F}_{net} = f_1 + f_2 \quad \vec{F}_{net} = 0 + (-49.05) \quad \vec{F}_{net} = -49.05\ N$

Part 3 - $\vec{F}_{net} = m\vec{a} \quad -49.05 = 10\vec{a} \quad \vec{a} = -4.905\frac{m}{s^2}$

Part 4 - $\vec{F}_{net} = m\vec{a} \quad \vec{F}_{net} = (5)4.905 \quad \vec{F}_{net} = 24.53\ N$

Part 5 - $\vec{F}_{net} = W - T \quad 24.53 = 49 - T \quad -24.5 = -T$



Answer - Part 1 - $\vec{F}_g = mg \quad \vec{F}_g = (3.0)(9.81) \quad \vec{F}_g = 29.4\ N$

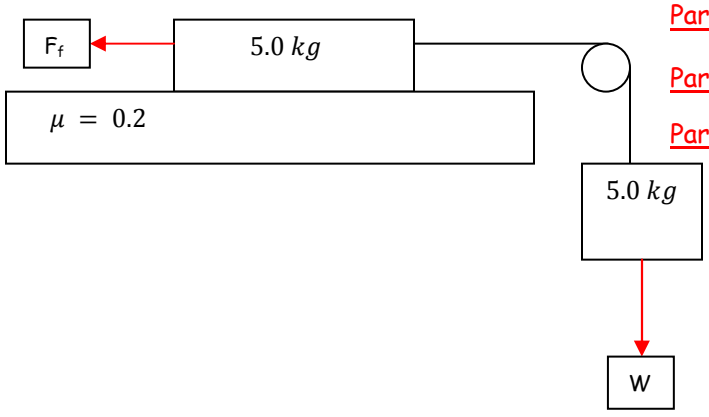
$\vec{F}_g = mg \quad \vec{F}_g = (10.0)(9.8) \quad \vec{F}_g = 98.1\ N$

Part 2 - $\vec{F}_{net} = f_1 - f_2 \quad \vec{F}_{net} = 98.1 - 29.4 \quad \vec{F}_{net} = 68.6\ N$

Part 3 - $\vec{F}_{net} = m\vec{a} \quad 68.6 = 13\vec{a} \quad \vec{a} = 5.28\frac{m}{s^2}$

Part 4 - $\vec{F}_{net} = m\vec{a} \quad \vec{F}_{net} = (10)5.28 \quad \vec{F}_{net} = 52.8\ N$

Part 5 - $\vec{F}_{net} = W - T \quad 52.8 = 98.1 - T \quad -45.3 = -T$



Answer - Part 1 - $\vec{F}_f = \mu\vec{F}n \quad \vec{F}_f = (0.2)(-9.81)(5.0) \quad \vec{F}_f = +9.81\ N$

$\vec{F}_g = mg \quad \vec{F}_g = (5.0)(-9.81) \quad \vec{F}_g = -49.05$

Part 2 - $\vec{F}_{net} = f_1 - f_2 \quad \vec{F}_{net} = -49.05 - (+9.81)$

$\vec{F}_{net} = -39.24\ N$

Part 3 - $\vec{F}_{net} = m\vec{a} \quad -39.24 = 10\vec{a} \quad \vec{a} = -3.92\frac{m}{s^2}$

Part 4 - $\vec{F}_{net} = m\vec{a} \quad \vec{F}_{net} = (5)(3.92) \quad \vec{F}_{net} = 19.62\ N$

Part 5 - $\vec{F}_{net} = W - T \quad 19.62 = 49.05 - T \quad -29.4 = -T$