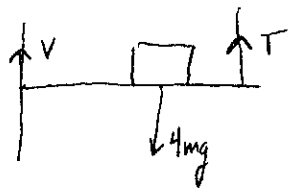


A1)



A1)

$$\sum \tau = 0$$

$$\sum F = 0$$

$$4mg(5L) - T(9L) = 0$$

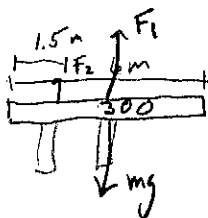
$$V + T - 4mg = 0$$

$$20mg = 9T$$

$$V + T = 4mg$$

$$T = \frac{20}{9} mg = 2.22mg$$

A2)



A2)

$$\sum \tau = 0$$

$$\sum F = 0$$

$$F_1(3) - m_g(3) = 0$$

$$F_1 + F_2 - mg = 0$$

$$F_1 = mg$$

$$F_1 + F_2 = 300(9.81)$$

$$F_1 = 300(9.81)$$

$$F_1 = 2940 \text{ N} \quad F_2 = 0$$

A3) you are attracted

to the moon due to your mass being attracted to the moon's mass.

A3)

$$F_g = G \frac{m_1 m_2}{r^2} = G \frac{m_m m_m}{r_{Em}^2}$$

$$= \frac{(6.67 \times 10^{-11}) (m) (7.35 \times 10^{22})}{(384 \times 10^6 \text{ m})^2}$$

$$F = 3.32 \times 10^{-5} (m) \text{ N}$$

A4) since the earth

also orbits the sun. Pluto's orbit and the Earth's orbit are proportional

A4)

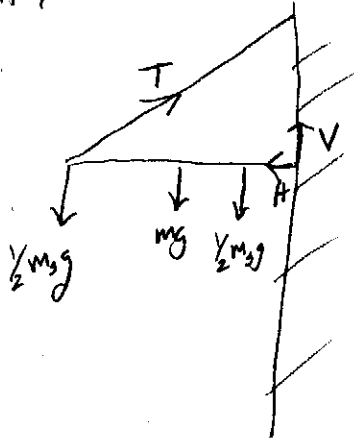
$$T_p = 246$$

$$\frac{T_A^2}{T_B^2} = \frac{r_A^3}{r_B^3}$$

$$\frac{(246)^2}{1^2} = \frac{r_A^3}{1^3}$$

$$r_A = 39.3 \text{ AU} = 5.87 \times 10^{12} \text{ m}$$

A5)



A5)

$$\sum F = 0$$

x)

$$H - T \cos \theta = 0$$

$$H = T \cos \theta$$

$$\sum \tau = 0$$

$$T \sin \theta + V - m_3 g - mg = 0$$

$$T \sin \theta + V = m_3 g + mg$$

$$\sum \tau = 0$$

$$T \sin \theta (2.15) - \frac{1}{2} m_3 g (2.15) - \frac{1}{2} m_3 g (.15) - mg (1.075) = 0$$

$$T \sin (33.07) (2.15) = \frac{1}{2} (8.5) (9.81) (2.15 + .15) + (1.75) (9.81) (1.075)$$

$$T = 88.5 \text{ N}$$

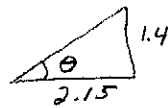
$$\sum \tau = 0$$

$$m_3 = 8.50 \text{ kg}$$

$$m = 1.75 \text{ kg}$$

$$\tan \theta = \frac{1.4}{2.15}$$

$$\theta = 33.070678^\circ$$



A6) The accel of g on a planet is based on its mass and size.

A6)

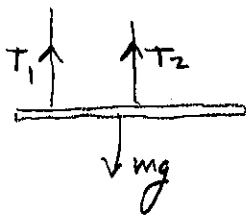
$$mg = F_g = G \frac{M M_p}{r_p^2}$$

$$g = G \frac{M_p}{r_p^2} = G \frac{5 M_E}{(4 r_E)^2}$$

$$g = G \frac{M_E}{r_E^2} \left(\frac{5}{16} \right) = \frac{5}{16} (9.81)$$

$$g = 3.06 \text{ m/s}^2$$

A7)



A7)

$$\sum F = 0$$

$$mg = 20 \text{ N} \quad \sum \tau = 0$$

$$T_1 + T_2 - mg = 0$$

$$mg (4L) - T_2 (5L) = 0$$

$$T_1 + T_2 = mg$$

$$T_2 = mg \left(\frac{4}{5} \right)$$

$$T_1 = \frac{1}{5} mg$$

$$T_2 = \frac{4}{5} mg$$

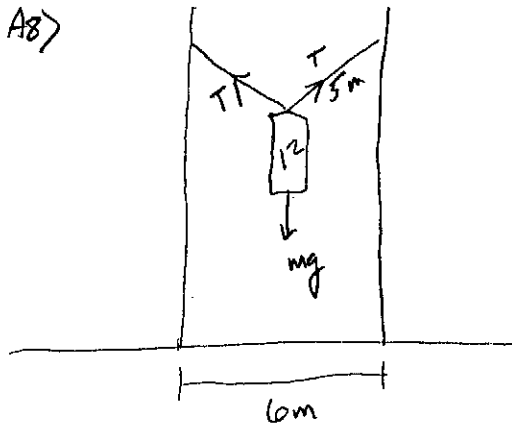
$$T_1 = 4.00 \text{ N}$$

$$T_2 = 16.0 \text{ N}$$

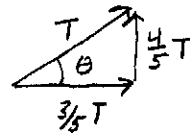
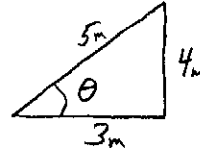
22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS



A8)



A8)



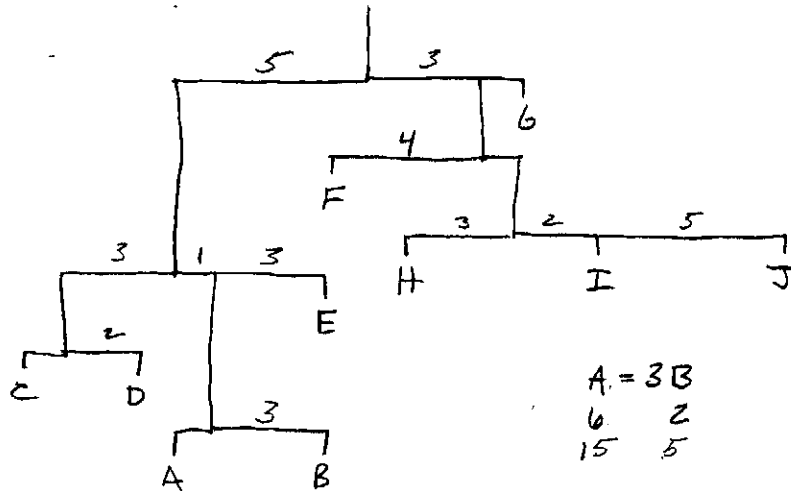
$\sum F = 0$

$2(4/5 T) - mg = 0$

$8/5 T = (12)(9.8)$

$T = 73.6 \text{ N}$

A9)



$3H = 2I + 7J$
 $\begin{matrix} 9 & 10 & 1 \\ 27 & & 7 \end{matrix}$

$3(C+D) = A+B+4E$
 $\begin{matrix} 8+4 & 6+2 & 7 \end{matrix}$

$A = 3B$
 $\begin{matrix} 6 & 2 \\ 15 & 5 \end{matrix}$

$C = 2D$
 $\begin{matrix} 2 & 1 \\ 4 & 2 \\ 8 & 4 \\ 10 & 5 \end{matrix}$

$4F = H + I + J$
 $\begin{matrix} 5 & 9+10+1 \end{matrix}$

$5(C+D+A+B+E) = 3(F+H+I+J) + 4G$
 $5(8+4+6+2+7) = 3(5+9+10+1) + 4(15)$
 $135 \checkmark \quad 135 \checkmark$

x 2 4 6 7 8 9 10 15

A	6	F	5
B	2	G	15
C	8	H	9
D	4	I	10
E	7	J	1