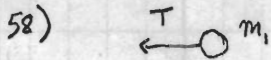


chapters 6 - 39, 58
7 - 2, 5, 7, 8, 16

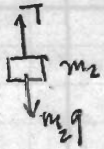
39) $v_0 = 10$
 $v = v_0 e^{-ct}$ $\Rightarrow 5 = 10 e^{-c \cdot 20}$
 $\ln 2 = c \cdot 20 \Rightarrow c = \frac{\ln 2}{20} = \boxed{.0347 \text{ s}^{-1}}$

b) $v = 10 e^{-\frac{\ln 2}{20} \cdot 40} = 10 e^{-2 \ln 2} = 10 \cdot 2^{-2} = 10/4 = \boxed{2.5 \text{ m/s}}$

c) $\frac{dv}{dt} = v_0(-c) e^{-ct} = \boxed{-c v}$



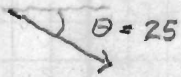
$T - m_2 g = 0 \Rightarrow \boxed{T = m_2 g}$



$T = m_1 v^2 / R$ which is the radial force

$\int_0^v m_1 \frac{v^2}{R} = m_2 g \Rightarrow v^2 = \frac{m_2 g R}{m_1} \Rightarrow \boxed{v = \left(\frac{m_2 g R}{m_1} \right)^{1/2}}$

2)



$F \cdot r = 35 \cdot 50 \cdot \cos 25 = \boxed{1586 \text{ J}}$

5) $\vec{A} \cdot \vec{B} = 5 \cdot 9 \cdot \cos 50 = \boxed{28.9}$

7) $\vec{F} = (6, -2)$ $\vec{F} \cdot \Delta \vec{r} = 18 - 2 = \boxed{16 \text{ J}}$

$\Delta \vec{r} = (3, 1)$

$16 = F \Delta r \cos \theta \Rightarrow \cos \theta = \frac{16}{\sqrt{40} \sqrt{10}} = \frac{4}{5} \Rightarrow \theta = \boxed{36.9^\circ}$

8) $\theta = 20^\circ$

$(32.8)(17.3) \cos 20 = \boxed{225}$

16)

$F = kx$

$230 = k(0.4) \Rightarrow k = \frac{230}{0.4} = \frac{2300}{4} = \boxed{575 \text{ N/m}}$

$\int_0^{0.4} F(x) dx = \int_0^{0.4} kx dx = \frac{1}{2} kx^2 \Big|_0^{0.4} = \frac{1}{2} (575) \left(\frac{4}{10} \right)^2 = \boxed{46 \text{ J}}$