1.

$F = 620N \qquad \theta = 42°$

$F_x = F\cos\theta$

$F_x = 620N \cos 42°$

$F_x = 460.7 N$

$W = F_x \cdot \Delta s = (460.7 N)(160m)$

$$\boxed{W = 73,720 \text{ J}}$$

2.
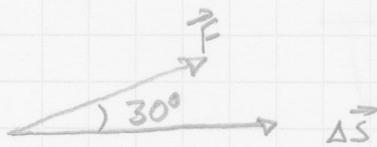
$F = ? \qquad \theta = 30°$
$W = 9600 J$
$\Delta s = 25m$

$W = \vec{F} \cdot \Delta \vec{s} = F \Delta s \cos\theta$

$F = \dfrac{W}{\Delta s \cos\theta} = \dfrac{9600 J}{\cos 30° \cdot 25m}$

$$\boxed{F = 443N}$$

3.
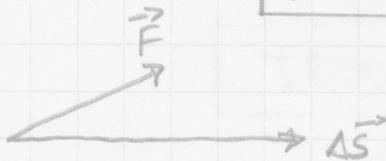
$\Delta s = 24m$
$\theta = ?$
$F = 640N$
$W = 12,500 J$

$W = \vec{F} \cdot \Delta \vec{s} = F \Delta s \cos\theta$

$\cos\theta = \dfrac{W}{F \cdot \Delta s}$

$\theta = \cos^{-1}\left(\dfrac{W}{F \cdot \Delta s}\right) = \cos^{-1}\left(\dfrac{12\,500 J}{640N \cdot 24m}\right)$

$$\boxed{\theta = 35.5°}$$

4.
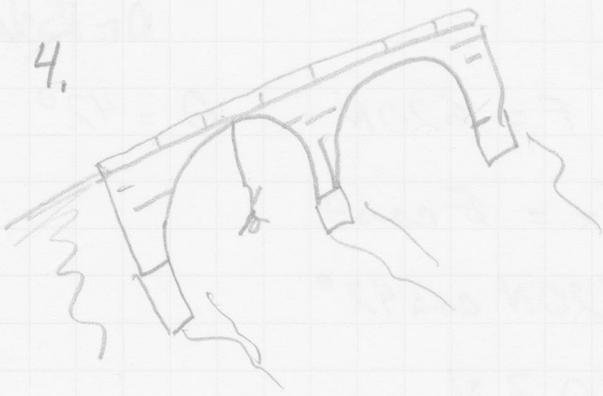
$$m = 60\,kg$$
$$\Delta s = 20\,m$$
$$g = 9.8\,m/s^2$$
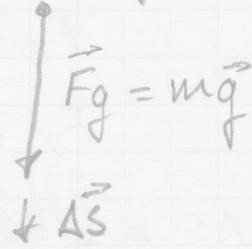
$$\vec{F_g} = m\vec{g} \qquad \theta = 0°$$

$$W = \vec{F} \cdot \Delta \vec{s}$$

$$W = mg\,\Delta s =$$
$$= (60\,kg)(9.8\,m/s^2)(20\,m)$$

$$\boxed{W = 11,760\,J}$$

5.
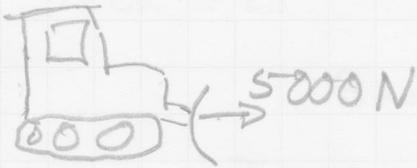
$$\xrightarrow{5000\,N} \qquad \theta = 0 \qquad \Delta s = (2\,m/s)(20s)$$

$$\Delta s = 40\,m$$

$$F = 5000\,N$$
$$W = ?$$

$$W = F \cdot \Delta s = (5000\,N)(40\,m)$$

$$\boxed{W = 200,000\,J}$$

6.

$$F_N \quad mg$$

$$m = 71\,kg + 179\,kg = 250\,kg$$
$$F = F_g = mg \qquad \theta = 0°$$
$$\Delta s = 58\,m$$

$$\Delta \vec{s} \quad \vec{F_N}$$
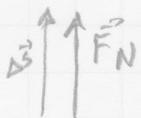
$$W = \vec{F} \cdot \Delta \vec{s} = mg\,\Delta s = (250\,kg)(9.8\,m/s^2)(58\,m)$$

$$W = 142,100\,J$$

7. P.330

$\vec{F_f}$ $\vec{F} = 250N$

→ ΔS $F = 250N$ $\theta = 0°$

$\Delta S = 12.75 m$

Constant velocity means zero net force.

$$W = \vec{F} \cdot \vec{\Delta S} = F \, \Delta S \cos\theta$$

$$W = (250N)(12.75m)$$

$$\boxed{W = 3188 \, J}$$

F = 250N   ΔS = 12.75m $\theta = 0°$