SQ1: $\langle v \rangle = \Delta x / \Delta t = \boxed{0\ m/s}$

SQ2: same hand

SQ3: $v_x = 6\ km/hr$

$v_y = 8\ km/hr$

$v = \sqrt{v_x^2 + v_y^2} = \boxed{10\ km/hr}$

SQ4: $\Delta x = v_x \cdot t$

$\Rightarrow t = \Delta x / v_x$

$\Delta y = \frac{1}{2} g t^2$

$= \frac{1}{2} g \left(\Delta x / v_x\right)^2$

If $\Delta x \Rightarrow \Delta x/2$

$\boxed{\Delta y \Rightarrow \Delta y/4}$

SQ5: $v^2 = v_0^2 + 2a\Delta x$

$10^2 = 0 + 2a \cdot 50$

$100 = 100a$

$\boxed{a = 1\ m/s^2}$

SQ6:

$F_1 = F_2$ in magnitude

$F_4 > F_2$ since accelerating

$F_4 = F_3$ in magnitude

so $\boxed{F_2 < F_3}$

SQ7: $F_x = 160 \cos 60° - 80$

$= 80 - 80$

$= 0$

@ rest or constant velocity

SQ8: $\Delta E = W_{NC}$

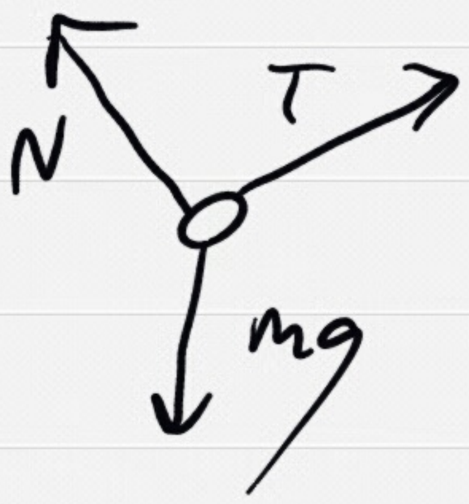
$\frac{1}{2} m v_f^2 - \frac{1}{2} m v_0^2 = F \Delta x \cos\theta$

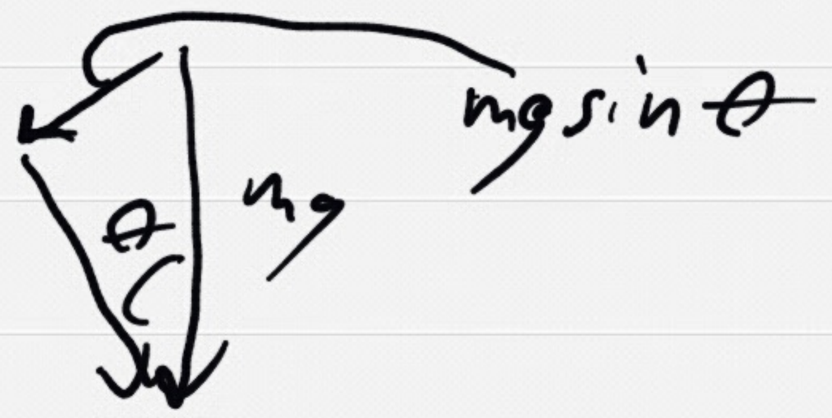
$-\frac{1}{2} m v_0^2 = -F \Delta x$

$\Delta x = \frac{\frac{1}{2} m v_0^2}{F}$

$= \boxed{12 \text{ m}}$

SQ9:





$T - mg\sin\theta = 0$

$\boxed{T = mg\sin\theta}$

SQ10: $F_c = mv^2/r = mg - N$

$\Rightarrow N = mg - mv^2/r$

$\Rightarrow \boxed{N < mg}$

SQ11: Lose PE by equal amounts, so gain KE by equal amounts w/ distance

SQ12: $E = \frac{1}{2}mv^2 + mgy$

$= \text{const.}$

$E_f = \frac{1}{2}mv_f^2 + mgh$

$E_0 = \frac{1}{2}mv_0^2$

$\Rightarrow v_f^2 = v_0^2 - 2gh$

$= 400 - 300$

$= 100$

$\Rightarrow \boxed{v_f = 10\ m/s}$

SQ13: $v^2 = v_0^2 + 2a\Delta x$

$0 = 80^2 - 2 \cdot 4 \cdot \Delta x$

$\Rightarrow 6400 = 8\Delta x$

$\Rightarrow \boxed{\Delta x = 800m}$

SQ14: $\langle v \rangle = 5\ m/s$

$\Delta x = \langle v \rangle \cdot t$

$= \boxed{10\ m}$

SQ15: $\Delta x \leq$ dist.

SQ16: $\vec{v} \perp \vec{a}$ @ top

SQ17: $\Delta x = 160\ m$

$V_{rel} = 4\ m/s$

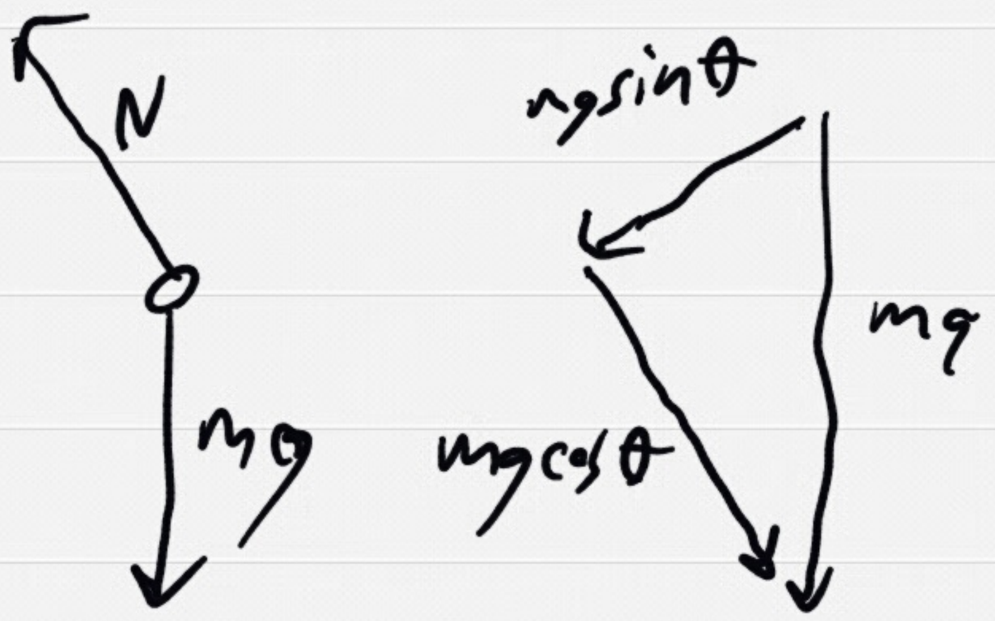
$\Delta t = \Delta x / V_{rel} =$ **40 s**

SQ18: $a = F_{net} = 30/15 = 2\ m/s^2$

$F_f = m_1 \cdot a$

$= 5 \cdot 2 =$ **10 N**

SQ19:



$a = g \sin\theta = g/2$

$=$ **4.9 m/s²**

SQ20: $F_c = mv^2/r$

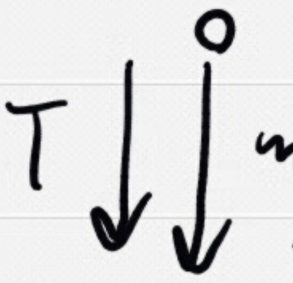
$= 1800 \cdot 10^2 / 50$

$=$ **3600 N**

SQ21: $W_g < 0$

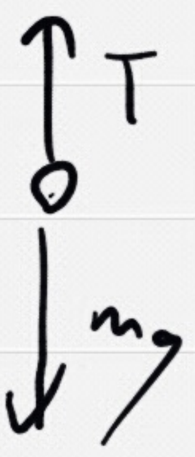
so $\boxed{W_g = 0 \text{ is false}}$

SQ22: ⓑ top



$mv^2/r = T + mg$

ⓐ bottom



$mv^2/r = T - mg$

$\boxed{T \text{ smallest}}$
$\boxed{\text{ⓐ top}}$

SQ23: $\Delta E = \Delta KE + \Delta PE = W_{NC}$

$= mgh = F\Delta x$

$= 10 \cdot 5 \cdot 0.5 = F \cdot 1$

$\Rightarrow \boxed{F = 25\ N}$

SQ24: $\Delta KE = -\Delta PE$

$\frac{1}{2} m v_f^2 = mgh$

To quadruple v_f, $\boxed{h \times 16}$