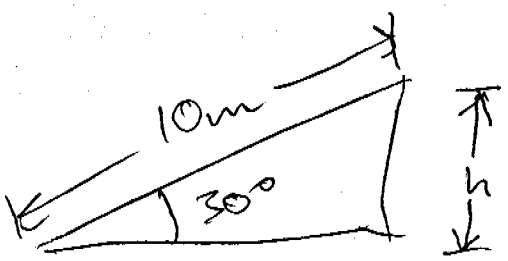
Solutions #1, 2, 3 of Final

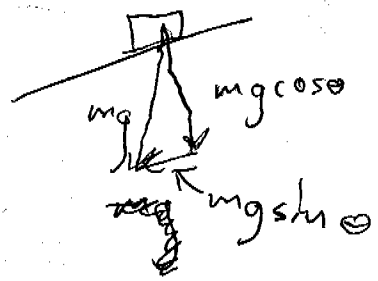


1 a) $x = \frac{1}{2} a t^2$

$a = g \sin(30°)$

$x = \frac{1}{4} g t^2$

$a = \frac{g}{2}$

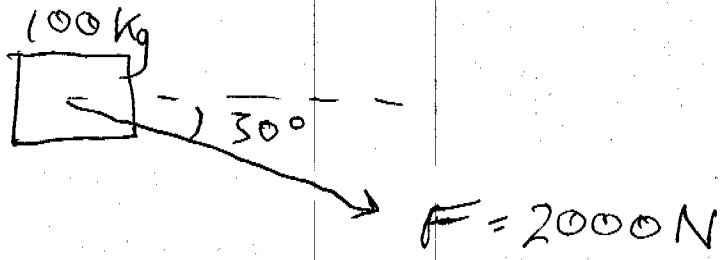


$t = \sqrt{\frac{40m}{g}} = \boxed{2s}$

b) $v = at = \frac{g}{2} 2s = \boxed{10 m/s}$

c) $mgh = mg(10 \sin(30°)) = mg(5)$

2)



a) $mg = n - 2000 \sin(30°)$

$1000N = n - 1000N$

$n = 2000N$

b) $F_x = 2000 \cos(30°) = 2000 \frac{\sqrt{3}}{2}$

$f = \mu n = 0.2 \cdot 2000N = 400N$