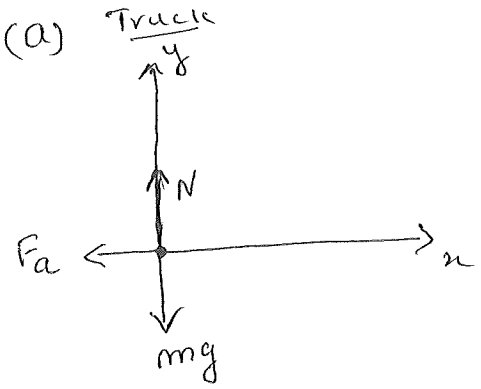
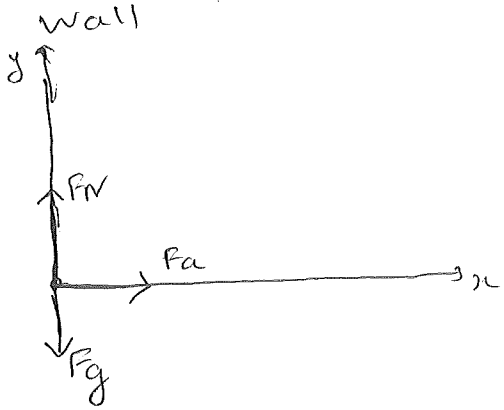
Physics 160 Written Homework - Chapter 4

Solutions

(a)





(b) $V^2 - V_0^2 = 2a\Delta x = 2a(x - x_0)$

$V_0 = 80\ \text{mph} = 128\ \text{km Ph} = 35.56$ metres Per second

$V = 0$
$x = 0.1\ m$
$x_0 = 0$
$\Delta x = 0.1\ m$

$a = \dfrac{-V_0^2}{2\Delta x} = \dfrac{-(35.56)^2}{2 \times 0.1}$

$a = -6322.57\ m/s^2$

(c) $\Sigma F_i = ma \Rightarrow F_a = ma$

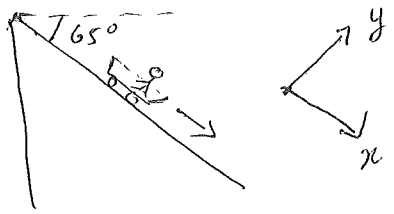
$m = 95{,}000\ \text{Lbs} \approx 95{,}000 \times 0.453\ kg$

$m = 43091.28\ kg$

$F = 43091.28 \times (-6322.57)$

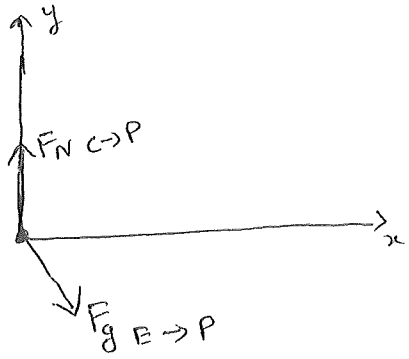
$= -272476\,34.19\ N \approx -2.72 \times 10^7\ N$

2,

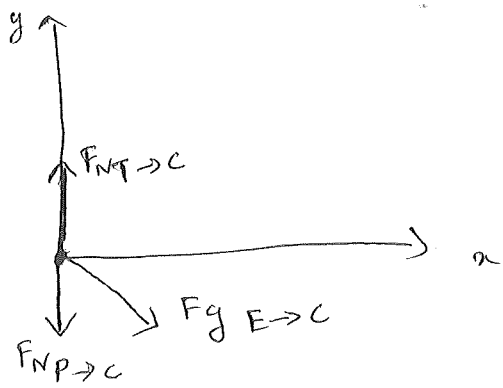


Free body diagrams

(i) Man



(ii) Car



(b) on the Free body diagrams one 3rd law pairs can be found they are $F_{N\,C\to P}$ (normal force car acts on man) & $F_{N\,P\to C}$ (Normal force Man acts on car)

Other forces

$F_{g\,E\to P}$: Force Earth acts on Person due to gravity
Its 3rd law pair is acted by Person on Earth

$F_{NT\to C}$: Normal force that Track acts on car.
Its 3rd law pair is the force that car acts on track

$F_{g\,E\to C}$: Force Earth acts on car due to gravity
Its 3rd law pair is acted by car on Earth.