Rigid body Equilibrium solutions



1. ΣFx = 0 = Tcos40 – H ΣFy = 0 = 1400 – T sin 40 – V

Στ = 0 = 600 sin 90 (L/2) + 800 sin 90 (L) – T sin 40 (3L/4) = 0

(1100)(4)/[3 sin 40] = T = **2282 N**

H = Tcos 40 = 2282 (cos 40) = **1748 N**

V = 1400 – T sin 40 = **– 67 N Meaning it points down**



1. ΣFx = 0 = T – H ; H = T ΣFy = 0 = 200 + 400 – V **V = 2400 up**

Στ = 0 = T sin 50 (3L/4) – 400 sin 40 (L/2) – 2000 sin 40 (L)

T = (4)(1415)/[3 sin 50] = 2463 N

H = 2463 N



1. ΣFx = 0 = Nwall – *f* ; ΣFy = 0 = 200 – Nground

Στ = 0 = Nwall(sin50)(L) = 200 (sin 40)(L/2); 200 sin 40(.4)/ sin 50 = Nwall

Nwall ­= 67.1 N

Nground = 200 N μ = *f*/N = 67.1/200 = 0.33



1. ΣFx = 0 = T – H; ΣFy = 0 = 1600 – V

Στ = 0 = T sin 50 (L) – 1600 sin 40 (L/2); 800 sin 40/ sin 50 = T = 671 N



1. ΣFx = 0 = T cos 55 – H ; ΣFy = 0 = T sin55 – 500 – 700 – V

Στ = 0 = 700 L + 500 (L/2) – T sin55 (0.4L)

950/[(0.4)( sin55)] = 2899 = T

2899(sin55) – 1200 = V = 1174 down

Tcos55 = H = 1663 right