Friction on Inclined Plane II

Solutions

1. ma = mgsinΘ – μmgcosΘ

a = g sinΘ – μgcosΘ🡪 μ = (gsinΘ - a)/g cosθ

μ = (5.62 – 1.75)/8.02 = 0.48

1. a = g sinΘ – μgcosΘ

4.14 – 1.77 = 2.37 m/s/s

1. μ = tan Θ = 0.466
2. an Θ = 0.466 (See problem 11 below for derivation)
3. a = g sinΘ – μgcosΘ🡪 μ = (gsinΘ - a)/g cosθ

(4.9 – 2.75)/8.48 = 0.253

5. a = g sinΘ – μgcosΘ

 5.62 – 1.20 = 4.42

6. ma = Forces UP – Forces down

 ma = Fapp - mgsinΘ – μmgcosΘ (friction opposes the motion UP the plan and points down the plane

 ma + mgsinΘ + μmgcosΘ = Fapp = 45 + 186.4 + 59.9 = 291 N

7. Constant vel μ = tan Θ = 0.500

8. a = g sinΘ – μgcosΘ

 a = 3.35 – 1.84 = 1.51 m/s/s

9. a = g sinΘ – μgcosΘ

 a = 2.61 – 2. 17 = 0.44 m/s/s

10. μ = (gsinΘ - a)/g cosθ

 μ = (2.79 – 1.10)/9.35 = 0.180

11 Σ Fy = 0 N = mgcosΘ ΣFx = 0 = mgsinΘ – μN

 0 = mgsinΘ – μmgcosΘ

μ = sinΘ /cosθ = tan Θ tan10 = 0.176