

Incline Exercises: Find the Acceleration

For each problem, a block is on an incline and you must find its acceleration. The angle of the incline and mass of the block are given in every problem. Remember that gravity and a normal force are needed in every problem! Some problems will have other forces in addition.

Make liberal use of your Inclines reference sheet / notes to help with these!

I recommend the three significant figure version of g : 9.81 N/kg.

1) Steepness: $\alpha = 25.0^\circ$, Mass: $m = 10.0$ kg

- A) Sketch a force diagram. B) Solve for a .

2) Steepness: $\alpha = 70.0^\circ$, Mass: $m = 10.0$ kg

- A) Sketch a force diagram. B) Solve for a .

3) Steepness: $\alpha = 5.00^\circ$, Mass: $m = 12.0$ kg, Push: $F_p = 15.0$ N uphill

- A) Sketch a force diagram. B) Solve for a .

- 4) Steepness: $\alpha = 37.0^\circ$, Mass: $m = 60.0$ kg, Friction: uphill with $\mu_k = 0.240$
(Remember, $F_f = \mu \cdot F_N$!! You'll have to find F_N before you can calculate F_f .)
A) Sketch a force diagram. B) Solve for a .

- 5) Steepness: $\alpha = 20.0^\circ$, Mass: $m = 2.00$ kg, Friction: uphill with $\mu_k = 0.240$
A) Sketch a force diagram. B) Solve for a .

6) **Honors students:**

Steepness: $\alpha = 20.0^\circ$, Mass: $m = 2.00$ kg, Push: $F_p = 12.0$ N uphill,
Friction: downhill with $\mu_k = 0.240$

- A) Sketch a force diagram. B) Solve for a .