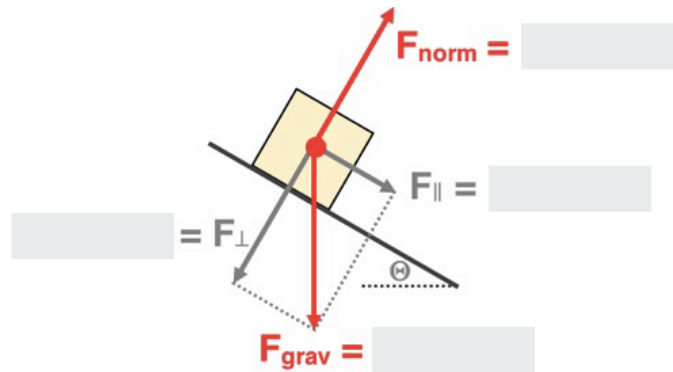## Solve It! (Inclined Planes)

NOTE: Numerical values used in this Concept Builder are randomly generated and likely different than those published here.

Apprentice Difficulty Level
Question 1
Analyze this: A 3.68-kg object accelerates down a friction-free incline that is inclined at 19.2° above the horizontal. Complete the diagram.

F_{norm} =

$F_∥$ =

= $F_⊥$

F_{grav} =

Units
Force: N
Mass: kg
Accel'n: m/s/s

m =

a =

F_{net} =

Question 2
Analyze this: A 8.98-kg object accelerates down a friction-free incline that is inclined at 24.7° above the horizontal. Complete the diagram.
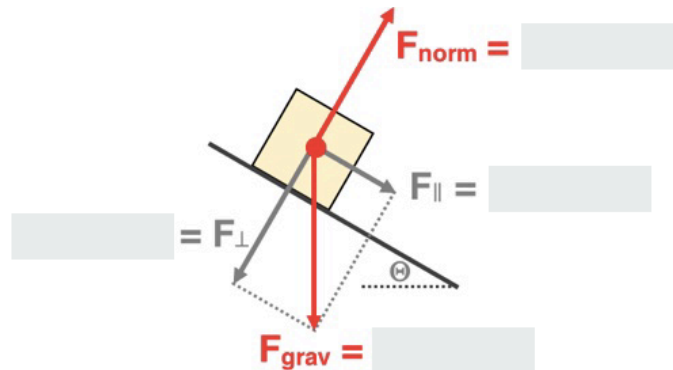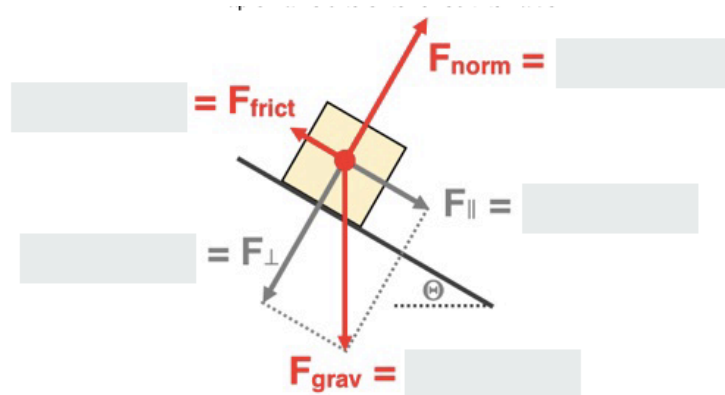
F_{norm} =

$F_∥$ =

= $F_⊥$

F_{grav} =

Units
Force: N
Mass: kg
Accel'n: m/s/s

m =

a =

F_{net} =

Master Difficulty Level
Question 3
Analyze this: A 4.92-kg object slides down an inclined plane that makes an angle of 19.2° with the horizontal. The coefficient of friction is 0.215. Complete the diagram.

$F_{norm} = $ ☐

$= F_{frict}$ ☐

$F_{\parallel} = $ ☐

$= F_{\perp}$ ☐

$F_{grav} = $ ☐
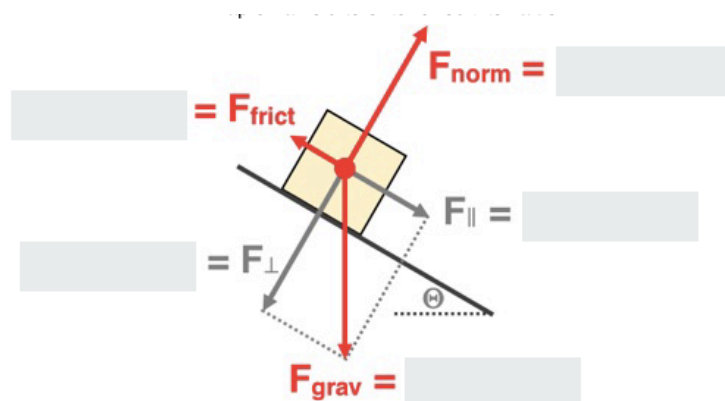
Units
Force: N
Mass: kg
Accel'n: m/s/s

$m = $ ☐

$a = $ ☐

$F_{net} = $ ☐

Question 4
Analyze this: A 14.1-kg object slides down an inclined plane that makes an angle of 26.4° with the horizontal. The coefficient of friction is 0.293. Complete the diagram.

$F_{norm} = $ ☐

$= F_{frict}$ ☐

$F_{\parallel} = $ ☐

$= F_{\perp}$ ☐

$F_{grav} = $ ☐

Units
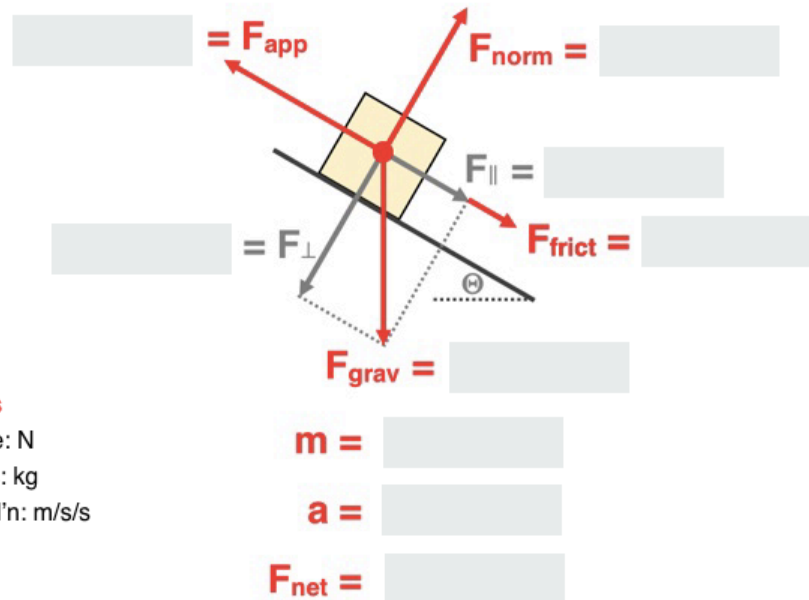Force: N
Mass: kg
Accel'n: m/s/s

$m = $ ☐

$a = $ ☐

$F_{net} = $ ☐

Wizard Difficulty Level
Question 5
Analyze this: A 173-N force is applied parallel to an inclined plane to accelerate a 18.0-kg object up the incline. The coefficient of friction is 0.221. The incline angle is 15.9°. Complete the diagram.

$= \mathbf{F_{app}}$ $\mathbf{F_{norm}} =$

$\mathbf{F_\parallel} =$

$= \mathbf{F_\perp}$ $\mathbf{F_{frict}} =$

$\mathbf{F_{grav}} =$

Units
Force: N
Mass: kg
Accel'n: m/s/s

$\mathbf{m} =$

$\mathbf{a} =$

$\mathbf{F_{net}} =$

Question 6
Analyze this: A 265-N force is applied parallel to an inclined plane to accelerate a 23.1-kg object up the incline. The coefficient of friction is 0.289. The incline angle is 24.7°. Complete the diagram.

$= \mathbf{F_{app}}$ $\mathbf{F_{norm}} =$

$\mathbf{F_\parallel} =$

$= \mathbf{F_\perp}$ $\mathbf{F_{frict}} =$

$\mathbf{F_{grav}} =$

Units
Force: N
Mass: kg
Accel'n: m/s/s

$\mathbf{m} =$

$\mathbf{a} =$

$\mathbf{F_{net}} =$