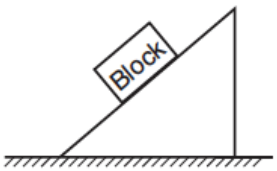
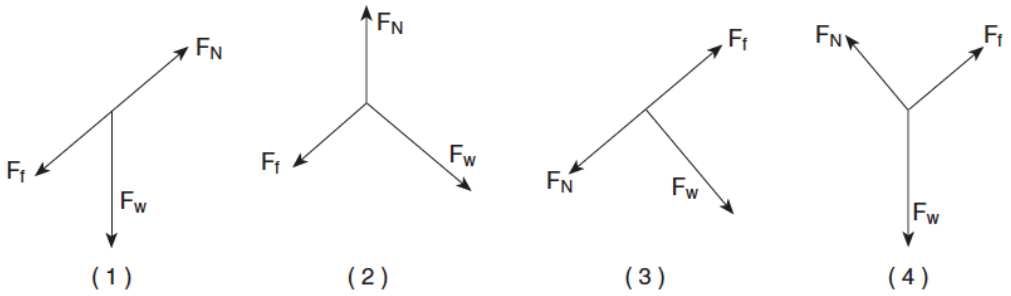
Name: _____ Period: _____

Dynamics-Ramps and Inclines

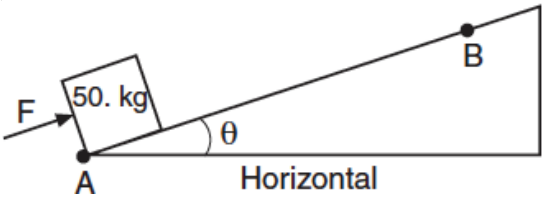
1. The diagram at right represents a block at rest on an incline.



Which diagram below best represents the forces acting on the block? (F_f = frictional force, F_N = normal force, and F_w = weight.)



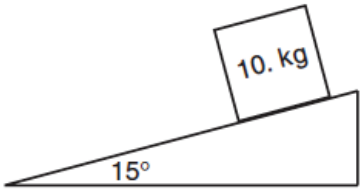
2. The diagram below shows a 50-kilogram crate on a frictionless plane at angle θ to the horizontal. The crate is pushed at constant speed up the incline from point A to point B by force F.



If angle θ were increased, what would be the effect on the magnitude of force F and the total work W done on the crate as it is moved from A to B?

1. W would remain the same and the magnitude of F would decrease.
2. W would remain the same and the magnitude of F would increase.
3. W would increase and the magnitude of F would decrease.
4. W would increase and the magnitude of F would increase.

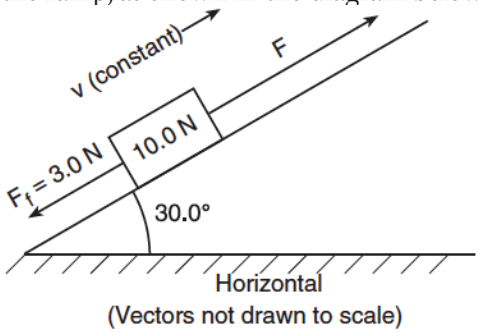
3. In the diagram below, a 10-kilogram block is at rest on a plane inclined at 15° to the horizontal.



As the angle of the incline is increased to 30°, the mass of the block will

1. decrease
2. increase
3. remain the same

4. A block weighing 10 newtons is on a ramp inclined at 30° to the horizontal. A 3-newton force of friction, F_f, acts on the block as it is pulled up the ramp at constant velocity with force F, which is parallel to the ramp, as shown in the diagram below.

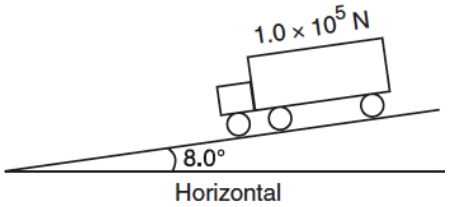


(Vectors not drawn to scale)

What is the magnitude of force F?

1. 7 N
2. 8 N
3. 10 N
4. 13 N

5. The diagram below shows a 1.0×10^5-newton truck at rest on a hill that makes an angle of 8.0° with the horizontal.



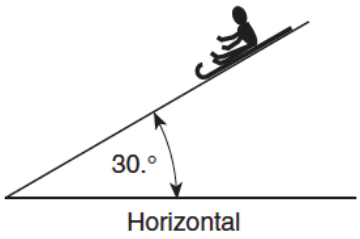
What is the component of the truck's weight parallel to the hill?

1. 1.4×10^3 N
2. 1.0×10^4 N
3. 1.4×10^4 N
4. 9.9×10^4 N

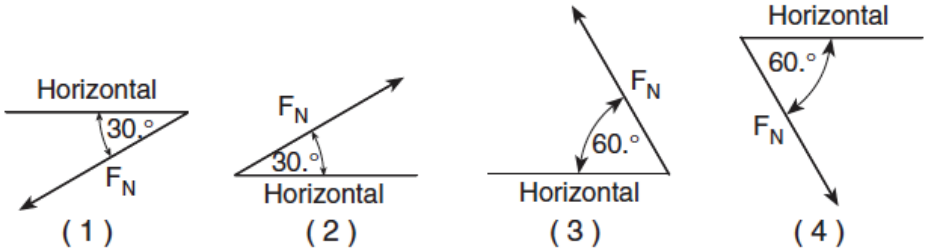
Name: _____ Period: _____

Dynamics-Ramps and Inclines

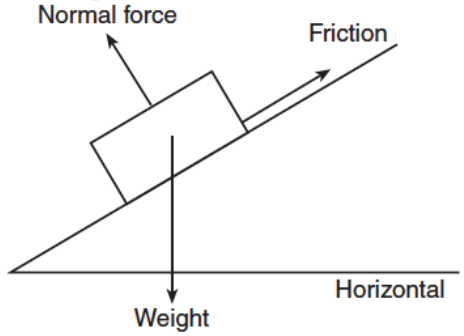
6. The diagram below shows a sled and rider sliding down a snow-covered hill that makes an angle of 30° with the horizontal.



Which vector best represents the direction of the normal force, F_N, exerted by the hill on the sled?



7. Three forces act on a box on an inclined plane as shown in the diagram below. [Vectors are not drawn to scale.]



If the box is at rest, the net force acting on it is equal to

1. the weight
2. the normal force
3. friction
4. zero