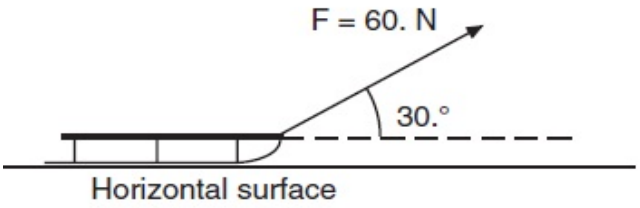
Name _____

A force of 60. newtons is applied to a rope to pull a sled across a horizontal surface at a constant velocity. The rope is at an angle of 30. degrees above the horizontal.



Calculate the magnitude of the component of the 60.-newton force that is parallel to the horizontal surface. [Show all work, including the equation and substitution with units.] [2]

A soccer player kicks a ball with an initial velocity of 10. meters per second at an angle of 30.° above the horizontal. The magnitude of the horizontal component of the ball's initial velocity is

(1) 5.0 m/s
(2) 8.7 m/s
(3) 9.8 m/s
(4) 10. m/s

A projectile is fired with an initial velocity of 120. meters per second at an angle, θ, above the horizontal. If the projectile's initial horizontal speed is 55 meters per second, then angle θ measures approximately

(1) 13°
(2) 27°
(3) 63°
(4) 75°

A 5.0-newton force could have perpendicular components of

(1) 1.0 N and 4.0 N
(2) 2.0 N and 3.0 N
(3) 3.0 N and 4.0 N
(4) 5.0 N and 5.0 N

A golf ball is hit with an initial velocity of 15 meters per second at an angle of 35 degrees above the horizontal. What is the vertical component of the golf ball's initial velocity?

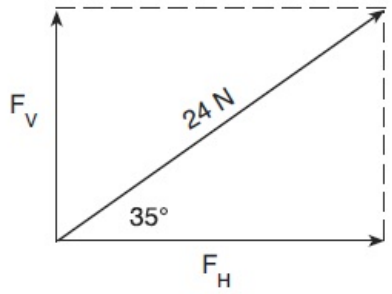
(1) 8.6 m/s
(2) 9.8 m/s
(3) 12 m/s
(4) 15 m/s

An airplane flies with a velocity of 750. kilometers per hour, 30.0° south of east. What is the magnitude of the eastward component of the plane's velocity?

(1) 866 km/h
(2) 650. km/h
(3) 433 km/h
(4) 375 km/h

Name _____

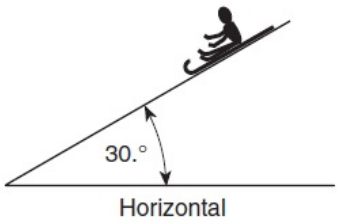
The vector diagram below represents the horizontal component, F_H, and the vertical component, F_V, of a 24-newton force acting at 35° above the horizontal.



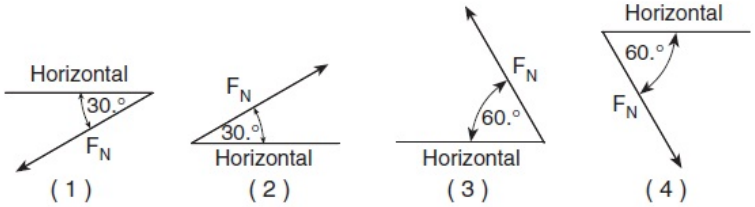
What are the magnitudes of the horizontal and vertical components?

(1) F_H = 3.5 N and F_V = 4.9 N
(2) F_H = 4.9 N and F_V = 3.5 N
(3) F_H = 14 N and F_V = 20. N
(4) F_H = 20. N and F_V = 14 N

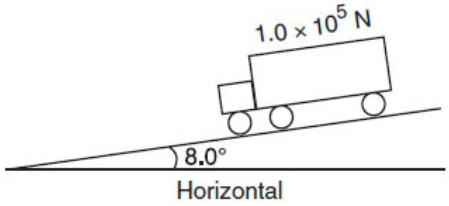
The diagram below shows a sled and rider sliding down a snow-covered hill that makes an angle of 30.° with the horizontal.



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



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 _____

A kicked soccer ball has an initial velocity of 25 meters per second at an angle of 40.° above the horizontal, level ground. [Neglect friction.]

Calculate the magnitude of the vertical component of the ball's initial velocity. [Show all work, including the equation and substitution with units.] [2]

A projectile is fired from the ground with an initial velocity of 250. meters per second at an angle of 60.° above the horizontal.

62 On the diagram below, use a protractor and ruler to draw a vector to represent the initial velocity of the projectile. Begin the vector at point *P*, and use a scale of 1.0 centimeter = 50. meters per second. [2]

63 Determine the horizontal component of the initial velocity. [1]

64 Explain why the projectile has *no* acceleration in the horizontal direction. [Neglect air friction.] [1]

P .