2D Forces Practice Test

Question 1

A 47 kg sled is pulled at a constant velocity on flat ground with a rope that is 18 degrees with the horizontal and tension of 25 Newtons. What is the force normal magnitude up on the sled in Newtons?

g = -10 m/s/s

Question 2

A 56 kg sled is pulled at a constant velocity on flat ground with a rope that is 45 degrees with the horizontal and tension of 18 Newtons. What is the force kinetic friction magnitude on the sled in Newtons? g = -10 m/s/s

Question 3

A 94 kg sled is accelerating while being pulled on flat ground (coefficient of kinetic friction .01) with a rope that is 37 degrees with the horizontal and tension of 46 Newtons. What is the acceleration magnitude of the sled in m/s/s? g = -10 m/s/s

Question 4

A lawn mower of mass 90 kg is being pushed at a constant velocity down and to the right on flat ground with a handle that is 29 degrees with the horizontal and compression force of 79 Newtons. What is the force friction magnitude against the mower in Newtons? g = -10 m/s/s

Question 5

A lawn mower of mass 102 kg is being pushed down and to the right on flat ground with a handle that is 27 degrees with the horizontal and compression force of 10 Newtons. The coefficient of both static and kinetic friction is .3. What is the acceleration magnitude of the mower in m/s/s? g = -10 m/s/s

Question 6

A lawn mower of mass 42 kg is being pushed at a constant velocity down and to the left on flat ground with a handle that is 35 degrees with the horizontal and compression force of 40 Newtons. What is the Force Normal magnitude on the mower in Newtons? g = -10 m/s/s

Question 7

A ramp is at an incline of 26 degrees. Assuming there is no friction, what is the acceleration magnitude of an object with mass 4 kg on the ramp in m/s/s? g = -10 m/s/s

Question 8

A ramp is at an incline of 16 degrees. Assuming there is friction with mu = .1 for both static and kinetic, what is the acceleration magnitude of an object with mass 5 kg on the ramp in m/s/s? g = -10 m/s/s

Question 9

A ramp is at an incline of 16 degrees. Assuming there is friction with mu = .1 for both static and kinetic, what is force normal magnitude in Newtons on an object with mass 5 kg which is on the ramp?

g = -10 m/s/s

Question 10

A ramp is at an incline of 16 degrees. Assuming there is friction with mu = .1 for both static and kinetic, what is force friction magnitude in Newtons on an object with mass 5 kg which is on the ramp?

g = -10 m/s/s

Question 11

A knot connects three ropes in static equilibrium. There is a knot connecting three ropes. Rope T1 emanates to left and up from the knot; it connects to the ceiling at an angle theta. Rope T2 emanates to the right from the knot; it is connected to a wall and is parallel to the ground. The bottom rope emanates straight down from the knot and is connected to the freely hanging mass M.

The bottom rope has tension from a hanging M=8 kg mass. The rope (T1) to the left of the knot creates and angle with the ceiling of 42 degree. The rope (T2) to the left is parallel to the ground. What is the tension magnitude in Newtons of the rope T1? g = -10 m/s/s

Question 12

A knot connects three ropes in static equilibrium. There is a knot connecting three ropes. Rope T1 emanates to left and up from the knot; it connects to the ceiling at an angle theta. Rope T2 emanates to the right from the knot; it is connected to a wall and is parallel to the ground. The bottom rope emanates straight down from the knot and is connected to the freely hanging mass M.

A knot connects three ropes in static equilibrium. The bottom rope has tension from a hanging M=8 kg mass. The rope (T1) to the left of the knot creates and angle with the ceiling of 42 degree. The rope (T2) to the left is flat to the ground. What is the tension magnitude in Newtons of the rope T2? g = -10 m/s/s

Question 13

When two concurrent (aka simultaneous) forces of 132 and 85 Newtons act on an object, what is the maximum resultant magnitude in Newtons?

Question 14

When two concurrent (aka simultaneous) forces of 128 and 88 Newtons act on an object, what is the minimum resultant magnitude in Newtons?

Question 15

A resultant force of 16 Newtons is made up of two vector components acting at 90 degrees to one another. If the magnitude of one component is 3 Newtons, what is the magnitude of the other component?