

**Analysis Honors
Vectors Worksheet 2**

- I. Use the formula $Work = \|F\| \|d\| \cos \theta$ to find the work done (in joules) by the force F, with given magnitude and direction, in moving an object the given distance at the given angle. (F is the force vector, d is the direction vector, θ is the angle between F and d)
- force of 15 N at 45° along a ramp 60 meters long at 30° .
 - force of 91 N at 10° along a ramp 100 meters long at 10° .
 - force of 15 N at 24° up a vertical cable a distance of 25 meter.
 - force of 422.36 N at 82° up a vertical cable a distance of 1 meter.
- II. Draw a figure to solve each of the following problems on a inclined plane.
- What is the weight of a car sitting on a 14° slope if the force required to push the car up the hill is 750 pounds.?
 - What is the force required to push a 40 pound lawn mower up a hill inclined at 8° ?
 - A 3000 pound car is sitting on a 12° slope. Find the magnitude of the force required to push the car up the slope and the magnitude of the force holding the car on the slope?
 - Two men push a 200 pound box up a ramp. Each man pushes with a force of 75 pounds in the direction of the incline of the ramp, and the box just moves up the ramp. At what angle is the ramp inclined?
 - Find the amount of work done by a force F of 12 N at 50° in moving a box of apples 30 meters up a ramp inclined at 20°

Answers:

1. 869.33 joules	2. 9100 joules	3. 152.53 joules
4. 418.25 joules	5. 3100.17 joules	6. 5.57 lbs.
7. Force to push the car up the hill: 623.74 lbs. Force to keep the car on the hill: 2934.44 lbs.	8. 48.59°	9. 311.77 joules