Pre-Calculus
Sec. 6.6 Vectors
Day 3

Ramp Problems:

Components of a ramp problem < x, y >

1. x-component: the magnitude of the force parallel to the ramp
   (this pulls the box up or down the ramp)

2. y-component: the magnitude of the force perpendicular to the ramp
   (this holds the box against the ramp)

Ex. 1) A 60lb box sits on a ramp with a 20° incline. What are the components of the force vector holding it there?

Ex. 2) A 30lb box is sitting on a ramp at a 12°incline from the horizontal. Find the magnitude of the force keeping the box from sliding down the ramp.

Ex. 3) You are standing on top of a hill with a 40° incline. It is a snowy day and you decide to go sledding, but you let your younger sibling go first to test the slope. Your sibling and the sled together are a total of 75lbs.

a) Find the components of the force vector.

a) What is the magnitude of the force keeping the sled from sliding down the hill?

Ex. 4) Three forces of 65 pounds, 130 pounds, and 55 pounds act on the same object at angles of 60^o, 45^o, and 150^o respectively, with the positive x-axis. Find the direction angle and magnitude of the resultant of these forces.

Ex. 5) A plane is at N65^{o}W with the speed of 500 mph. The wind is blowing from SW with the speed of 50 mph. Find the resultant speed and direction angle.