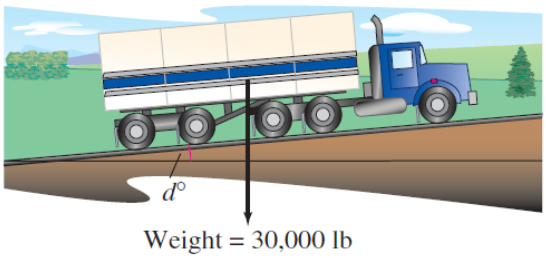
GPS Precalculus: Vector Applications WS 1

Name _____

Period _____ Date _____

1. ***Braking Load*** A truck with a gross weight of 30,000 pounds is parked on a slope of $d°$ (see figure). Assume that the only force to overcome is the force of gravity.



(a) Find the force required to keep the truck from rolling down the hill in terms of the slope d.

(b) Use a graphing utility to complete the table.

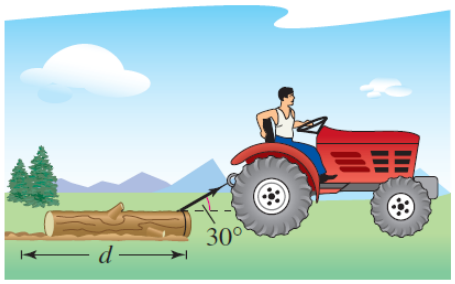
d	0°	1°	2°	3°	4°	5°
Force						

d	6°	7°	8°	9°	10°
Force					

(c) Find the force perpendicular to the hill when $d = 5°$.

2. ***Braking Load*** A sport utility vehicle with a gross weight of 5400 pounds is parked on a slope of 10°. Assume that the only force to overcome is the force of gravity. Find the force required to keep the vehicle from rolling down the hill. Find the force perpendicular to the hill.

3. ***Work*** A tractor pulls a log d meters and the tension in the cable connecting the tractor and log is approximately 1600 kilograms (15,691 newtons). The direction of the force is 30° above the horizontal (see figure).



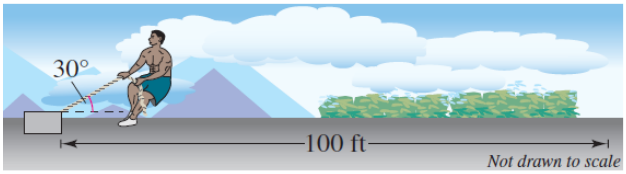
(a) Find the work done in terms of the distance d.

(b) Use a graphing utility to complete the table.

d	0	200	400	800
Work				

4. ***Work*** A force of 45 pounds in the direction of 30° above the horizontal is required to slide a table across a floor. Find the work done if the table is dragged 20 feet.

5. ***Work*** One of the events in a local strongman contest is to pull a cement block 100 feet. If a force of 250 pounds was used to pull the block at an angle of 30° with the horizontal, find the work done in pulling the block.



6. ***Work*** A toy wagon is pulled by exerting a force of 25 pounds on a handle that makes a 20° angle with the horizontal. Find the work done in pulling the wagon 50 feet.

7. ***Work*** A toy wagon is pulled by exerting a force of 20 pounds on a handle that makes a 25° angle with the horizontal. Find the work done in pulling the wagon 40 feet.

8. ***Work*** A mover exerts a horizontal force of 25 pounds on a crate as it is pushed up a ramp that is 12 feet long and inclined at an angle of 20° above the horizontal. Find the work done in pushing the crate up the ramp.