



Visual Physics RQ 4 for Recitation

Section # _____ Date _____ Names _____

You are leaving College Station on Spring break, but, unfortunately, your car breaks down in the middle of nowhere. You call a tow truck (weighing $\mathbf{W}_{\text{truck}}$) on your cell phone. The driver attaches his cable to your car, weight (\mathbf{W}_{car}) at an angle of (θ) with the horizontal. He tells you that his cable strength is \mathbf{F}_T (in other words, the cable is broken if the tension force exceeds \mathbf{F}_T) and that plans to take time (\mathbf{t}) to tow your car (at a constant acceleration from rest) in a straight line along the flat road until he reaches a maximum speed limit of (\mathbf{V}_f). Will the cable break? Consider the following two cases.

1. You assume no friction between your car's tires and the surface of the road.
2. You assume that the coefficient of rolling friction between your car's tires and the surface of the road is μ .

Be sure to write down ALL of your assumptions, force diagrams and complete formula derivations. Box answers.