Warm Up: Unit 3, Forces

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1 Memory Bank

1. $\vec{F}_{net} = \sum_i \vec{F}_i$ ... If $\vec{v} = 0$, Newton's First Law implies $\vec{F}_{net} = 0$.

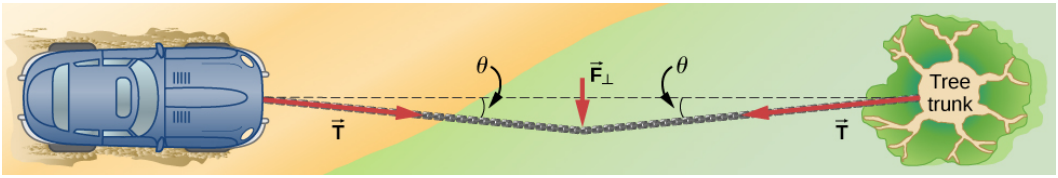

Figure 1: Person pushes in a direction orthogonal to a rope connecting a car and a tree.

2 Chapter 5 - Forces

1. If the force perpendicular to the rope, $\vec{F}_\perp$, and the left-pointing tension $\vec{T}$ and right-pointing tension $\vec{T}$ all cancel to yield $\vec{F}_{net} = 0$, show that
$$2T \sin\theta = F_\perp \tag{1}$$
Hint: it helps if you think of the tension vectors as pointing the opposite direction as shown in Fig. 1.

2. What is the tension in the rope if we find an angle $\theta = 10$ degrees, and $F_\perp = 500$ N?