

# February 22, Week 6

Today: Chapter 5, Applying Newton's Laws

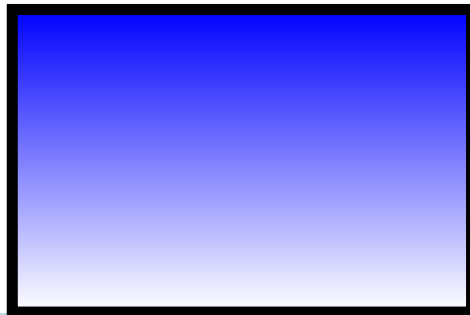
Homework Assignment #5 - Due March 1.

**Mastering Physics:** 10 problems from chapters 4 and 5.

**Written Questions:** 5.74

# Third Law Exercise

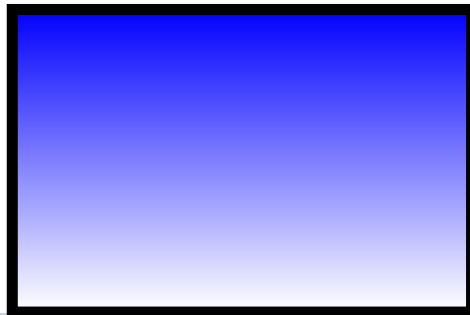
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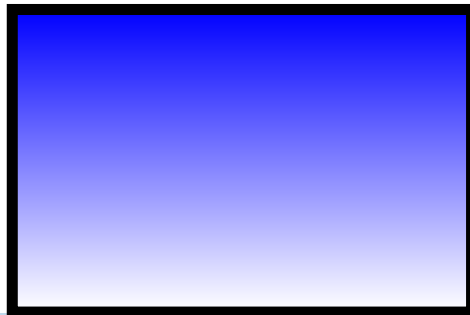
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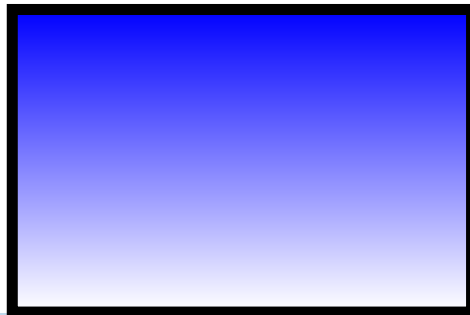
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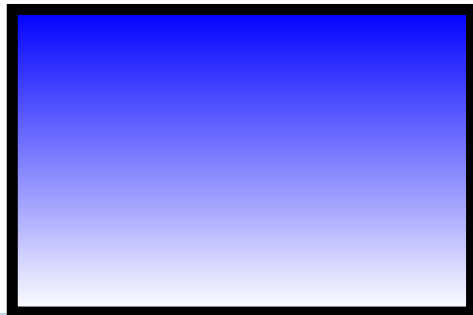
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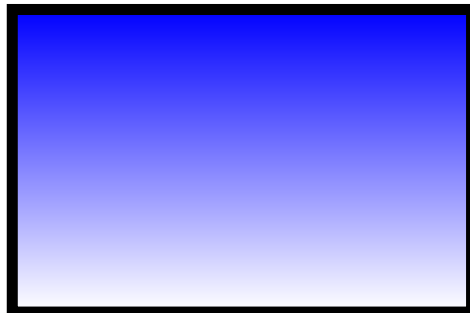
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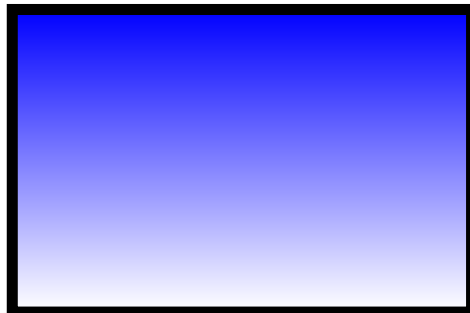


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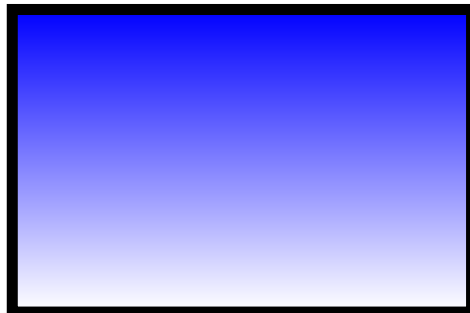
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$\vec{a} \neq 0$  are called dynamic or kinetics problems

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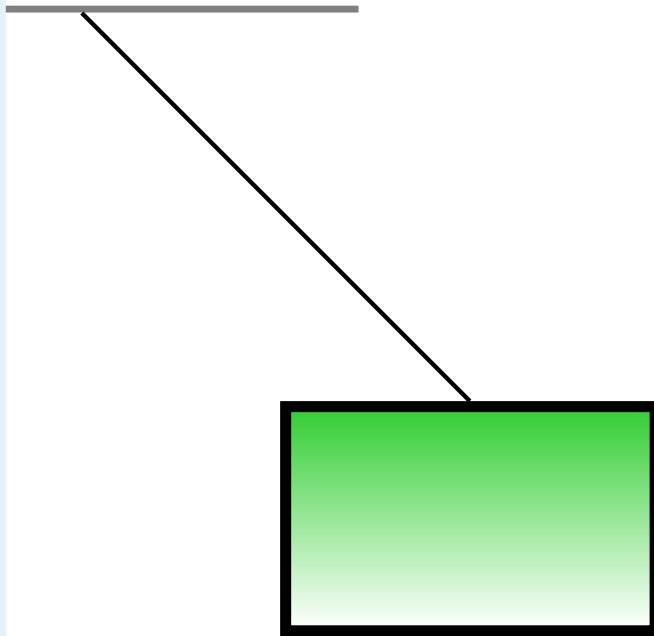
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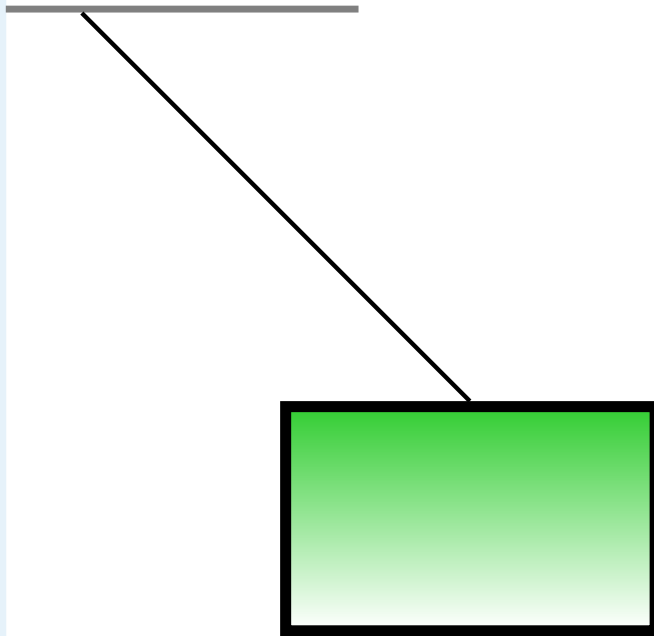
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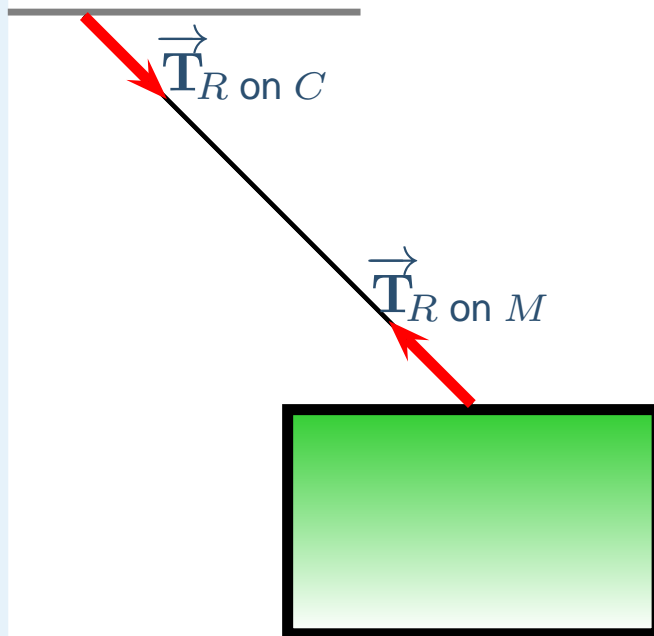
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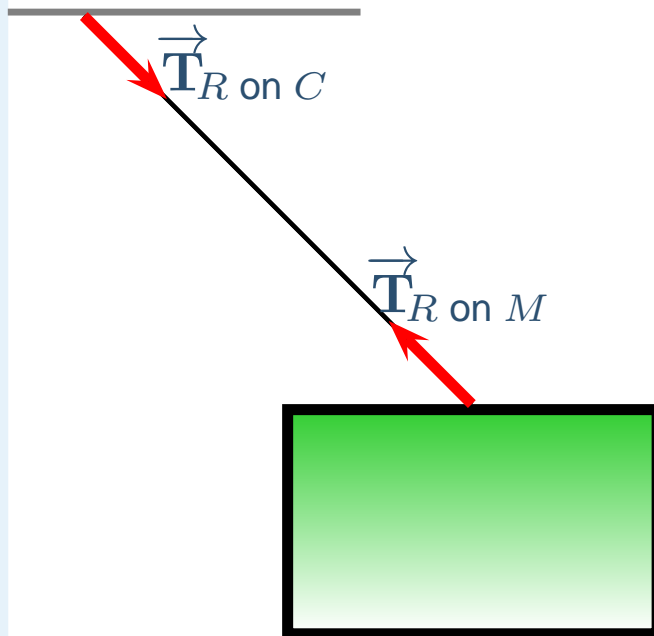
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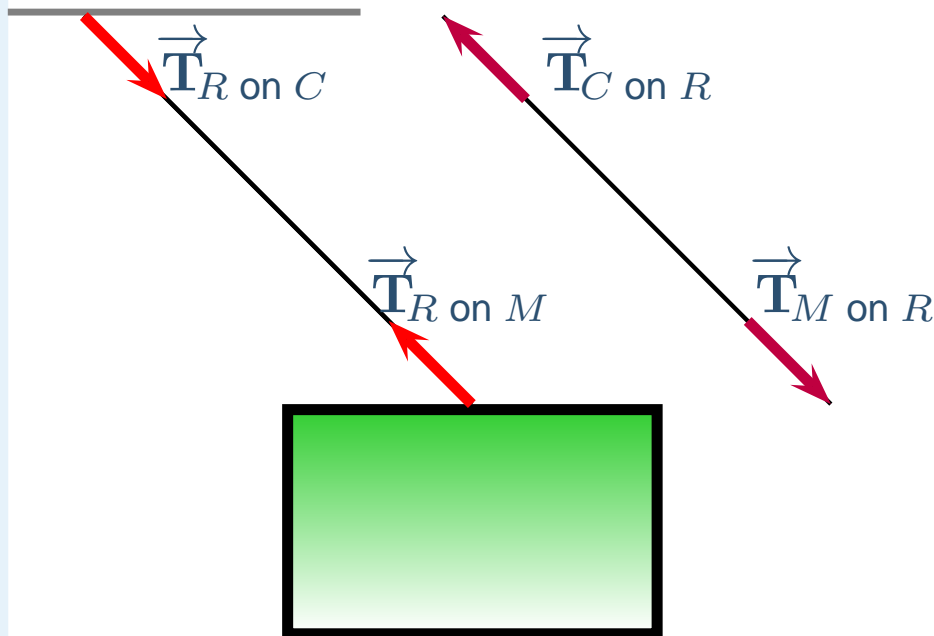
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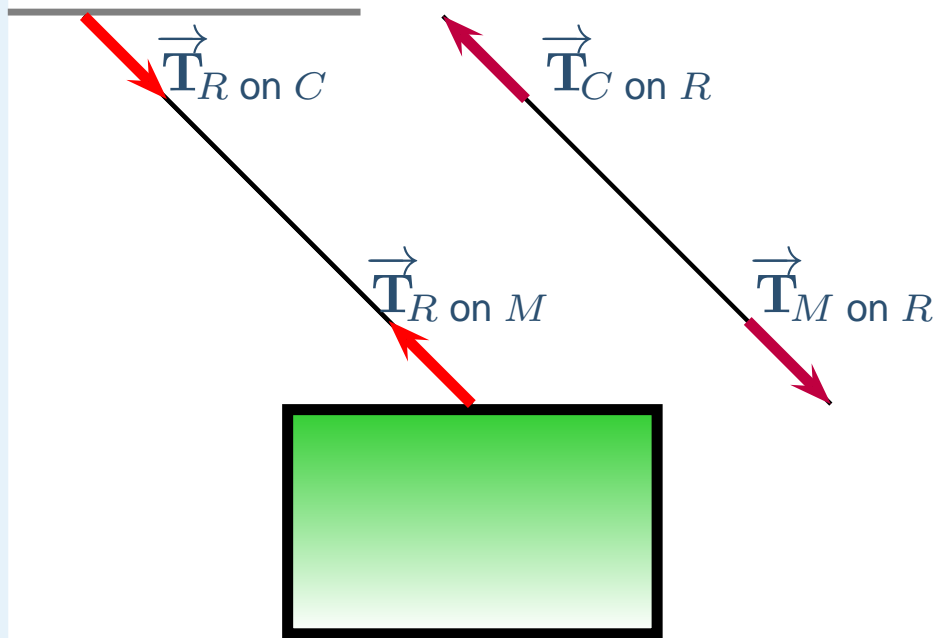
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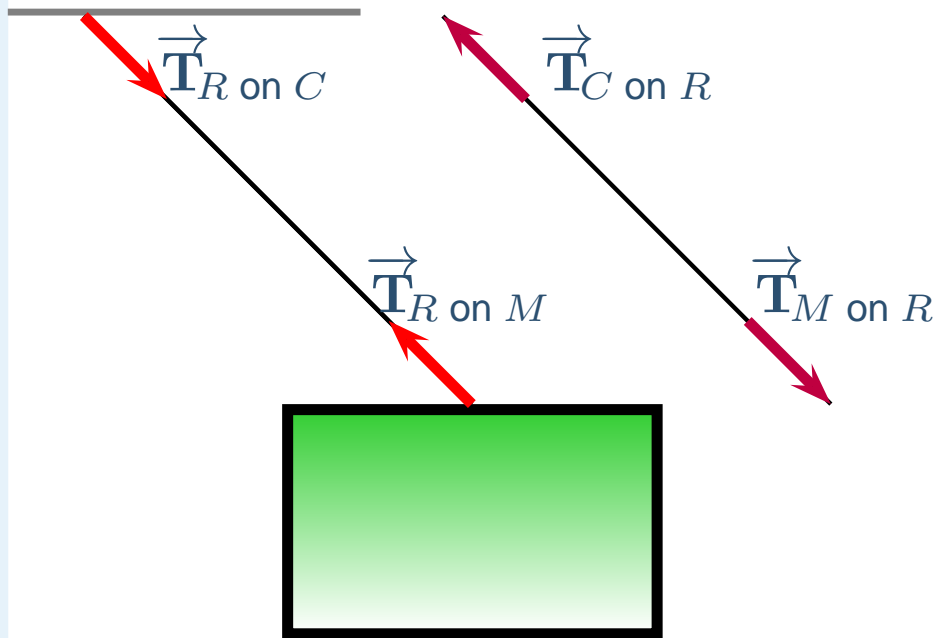
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$$M_{rope} = 0 \Rightarrow \vec{T}_{M \text{ on } R} = -\vec{T}_{C \text{ on } R}$$

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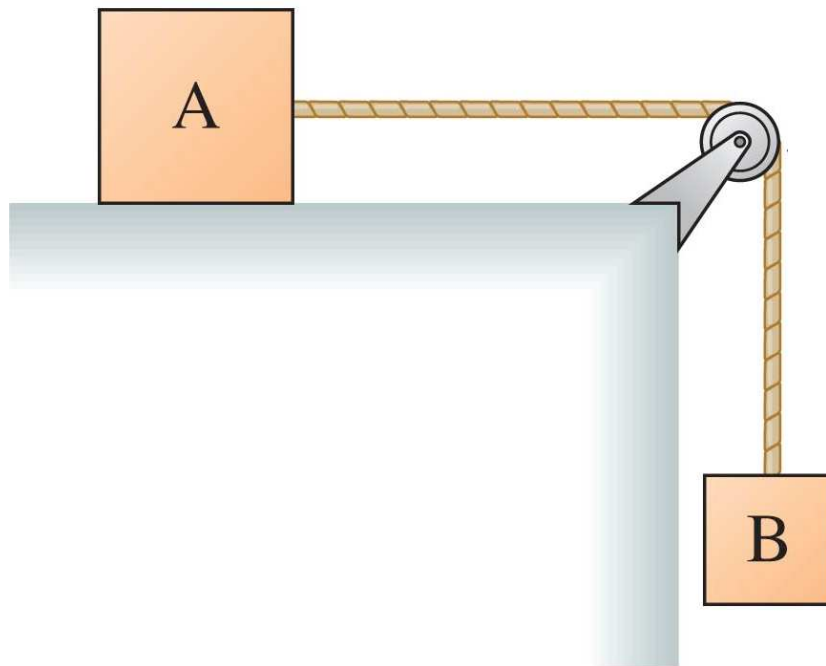
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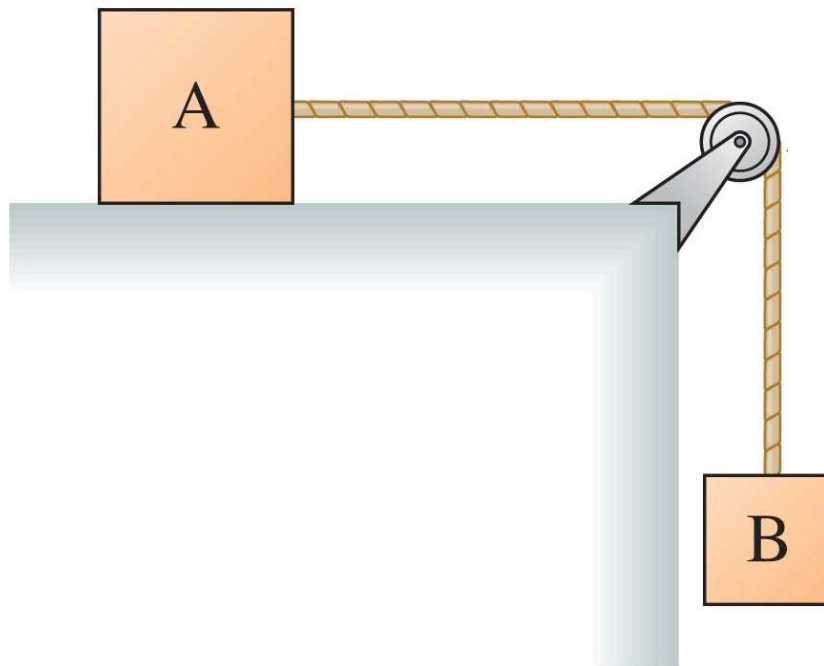
# Pulleys

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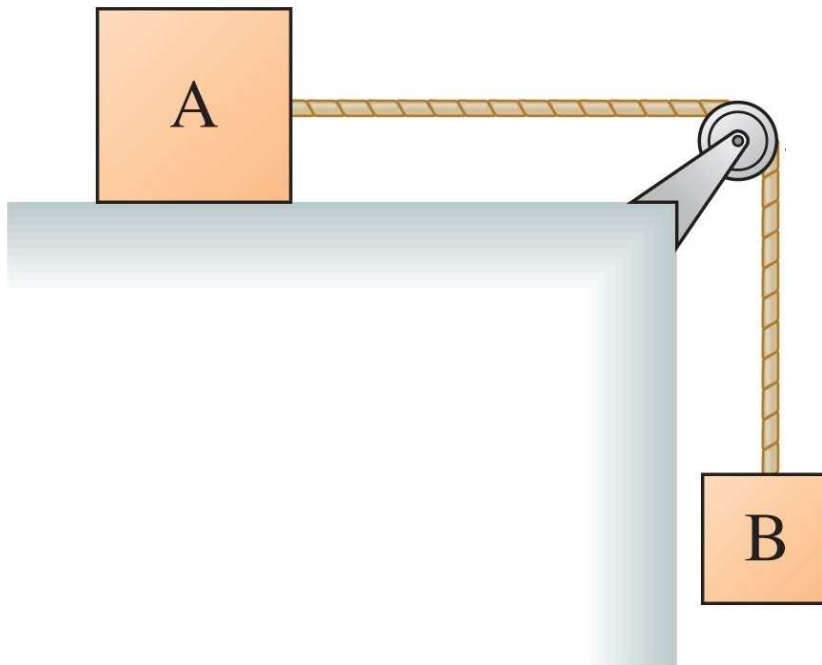
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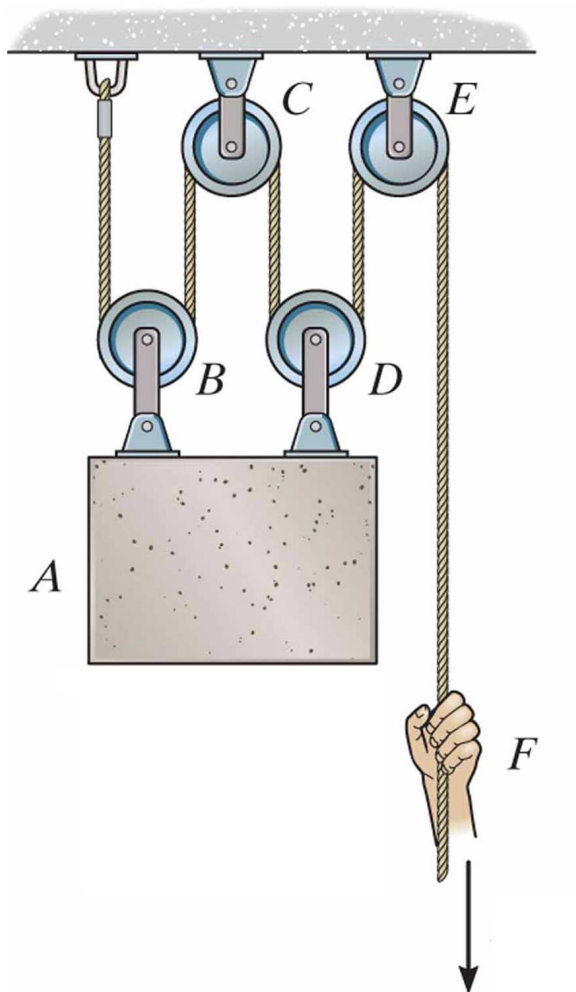
Pulley - Machine that changes the direction of applied forces

We use perfect pulleys  $\Rightarrow$  massless and frictionless. They change force direction with no change in magnitude.



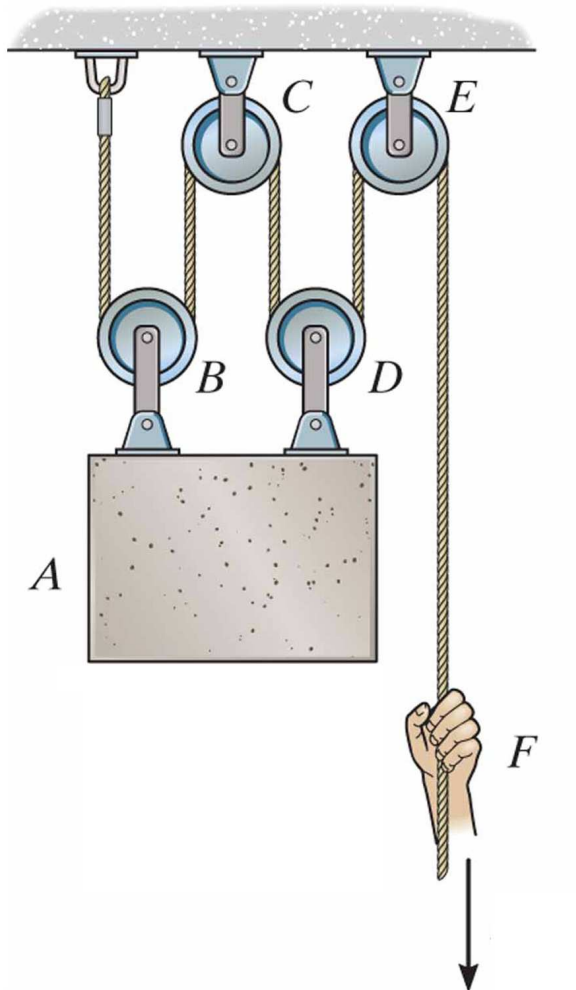
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How much force must a person exert on the massless rope shown in order to hold the 100- $N$  block at rest?



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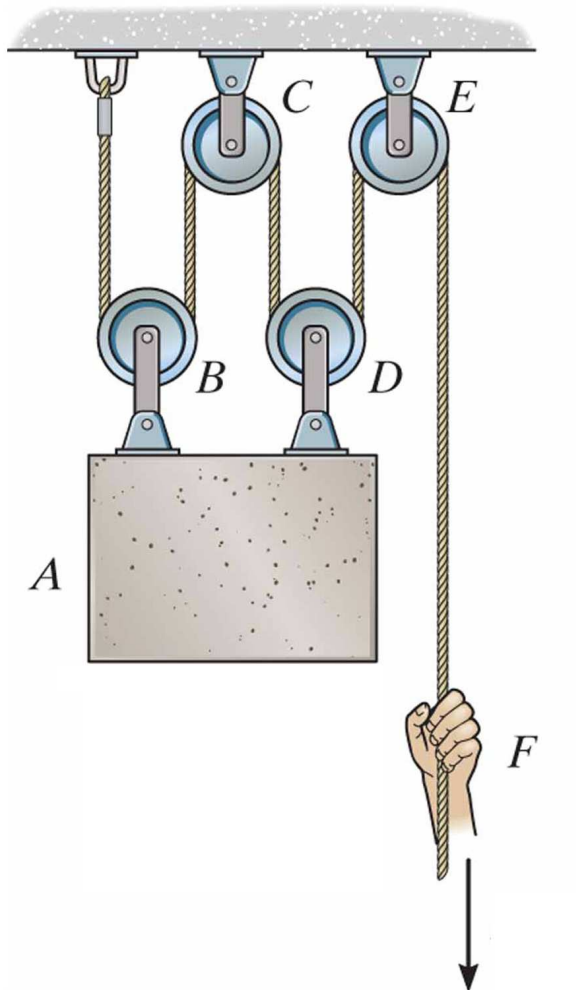
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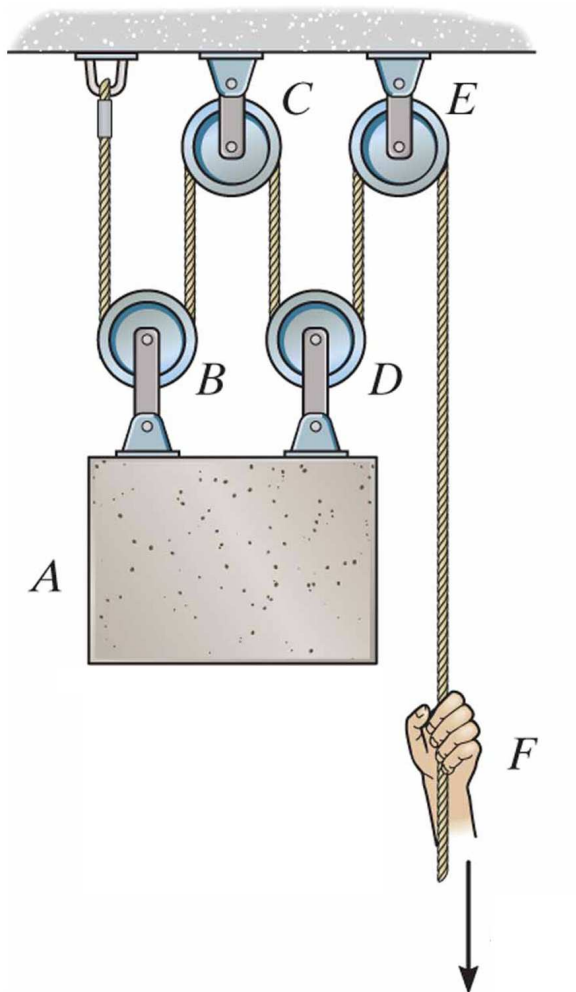


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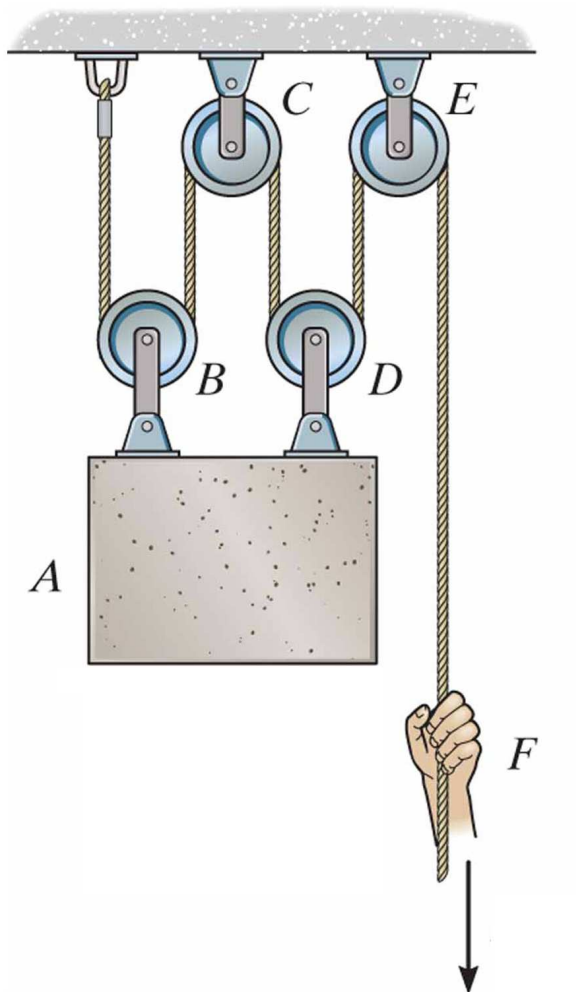
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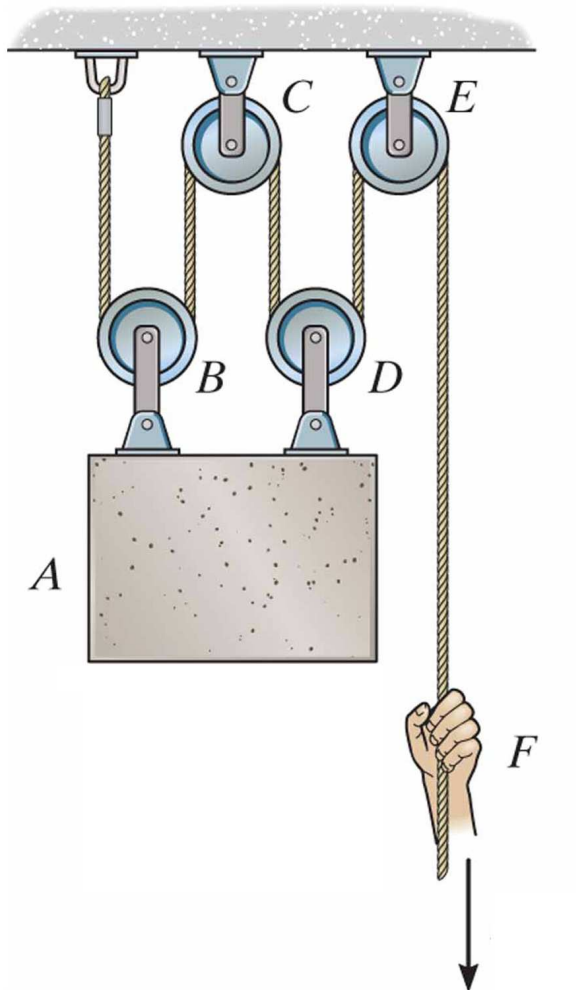
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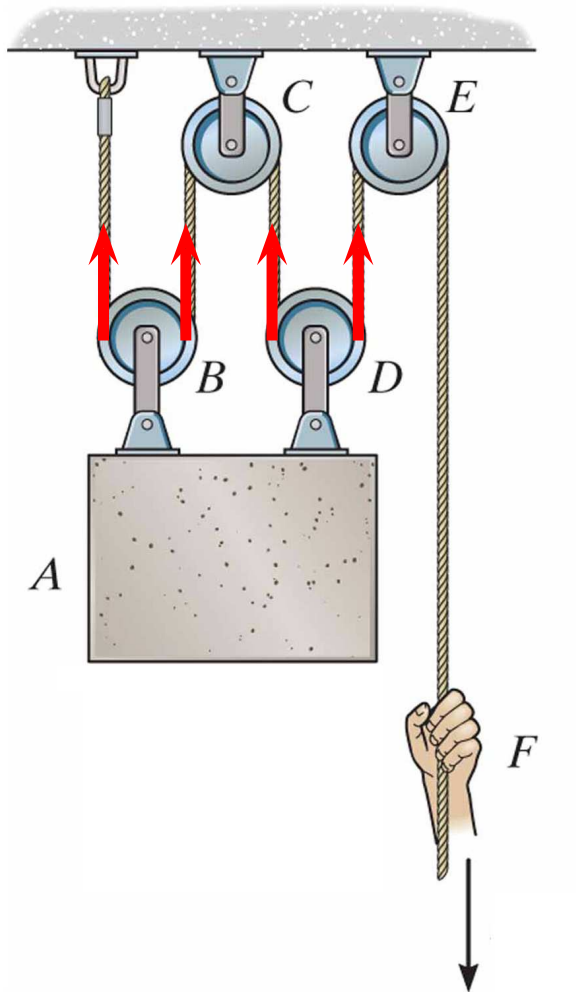
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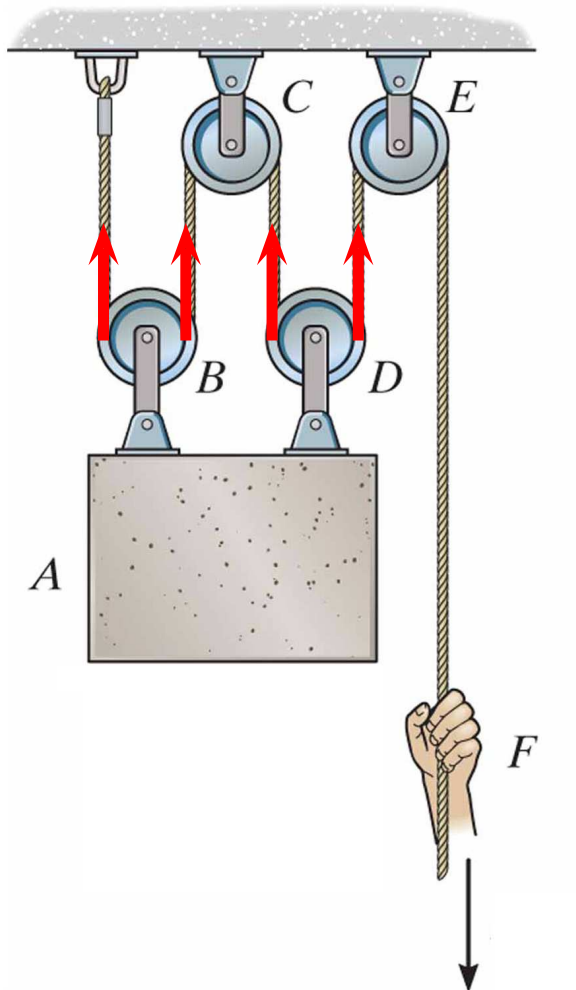
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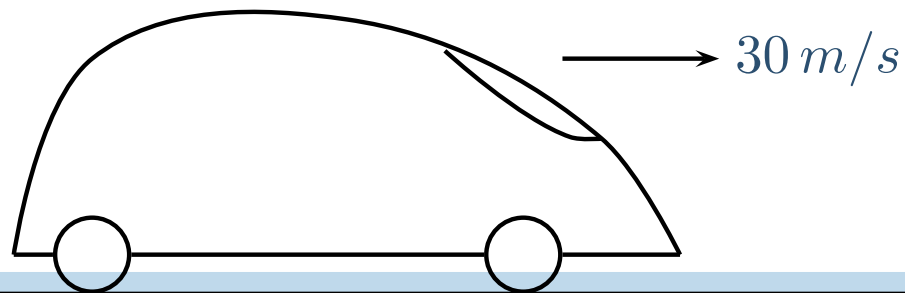
When an object accelerates, the forces do not add to zero and Newton's Second Law becomes

$$\sum F_x = Ma_x, \quad \sum F_y = Ma_y$$

But there are no *NEW* forces acting on the object!

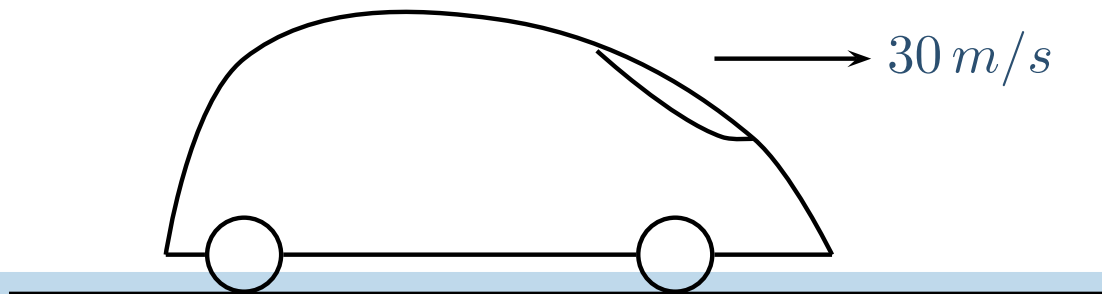
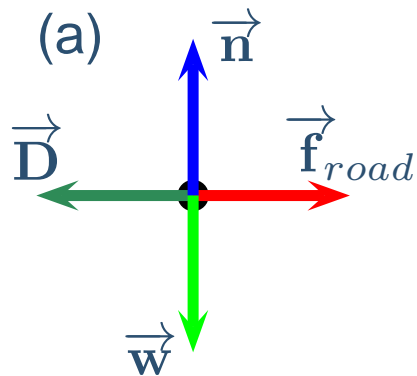
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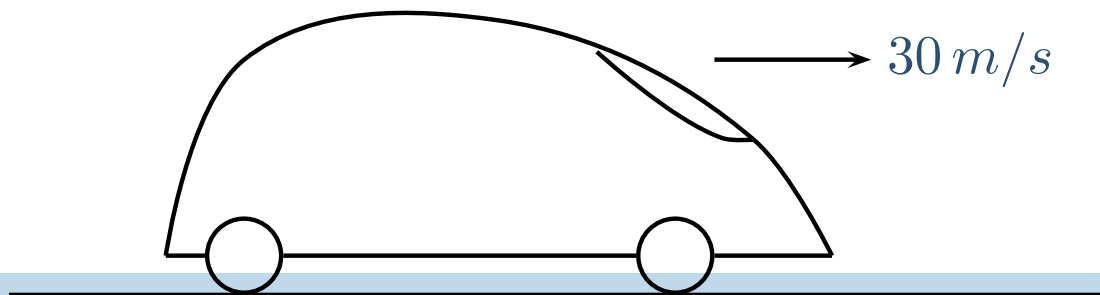
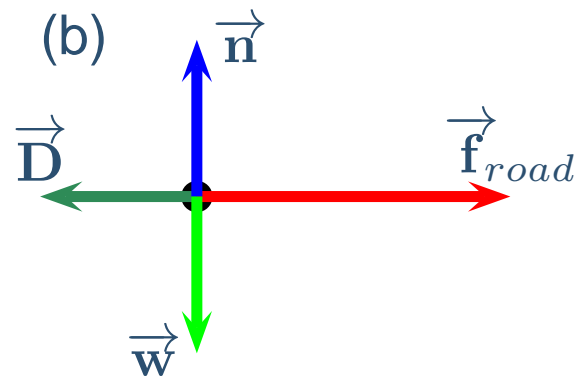
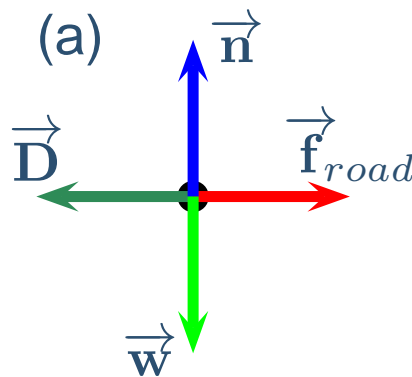
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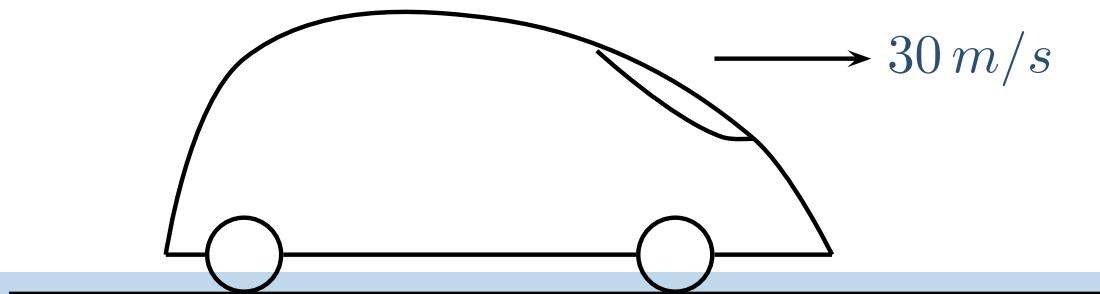
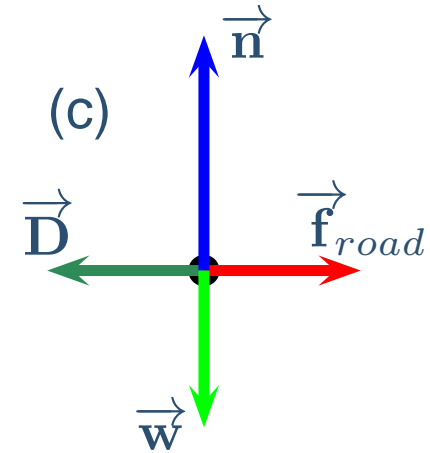
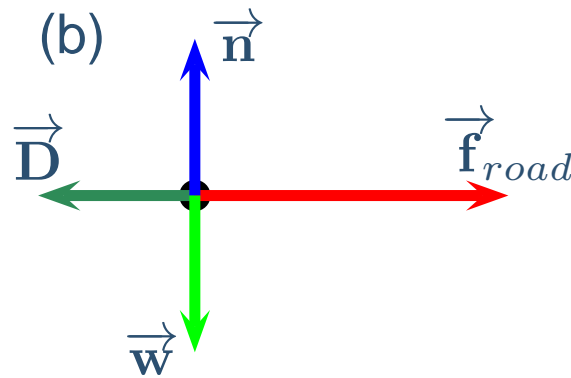
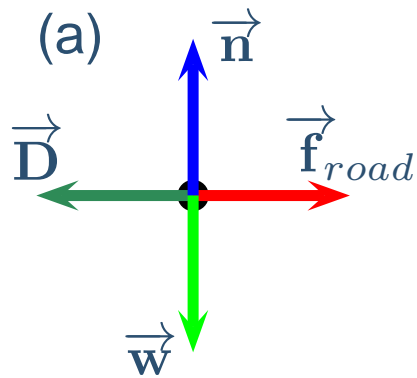
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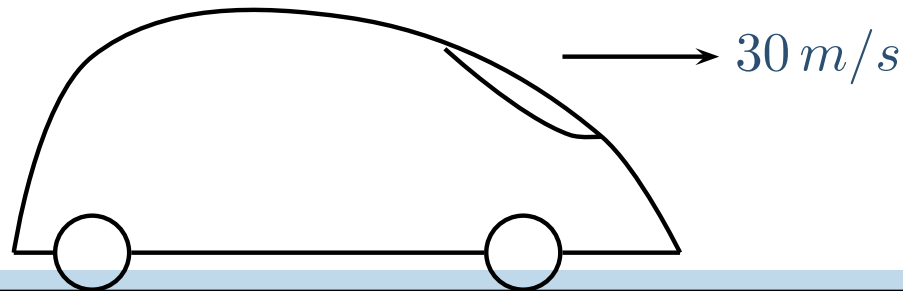
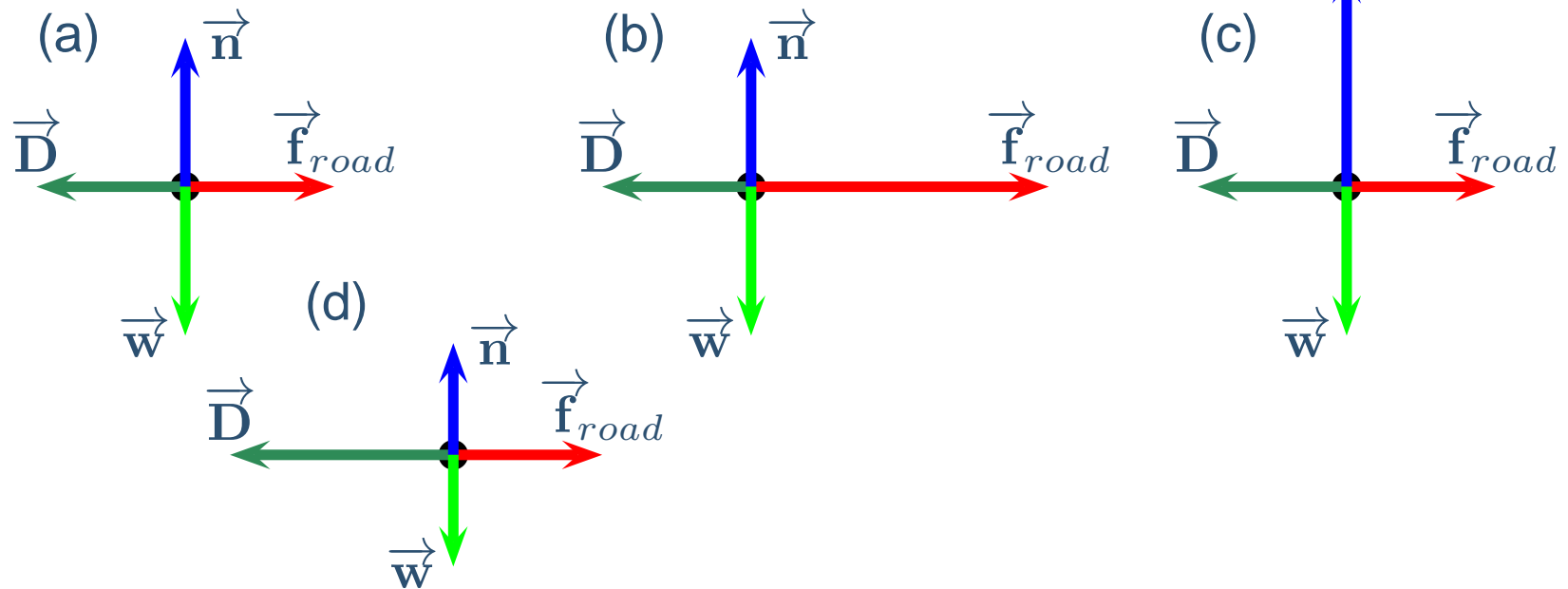
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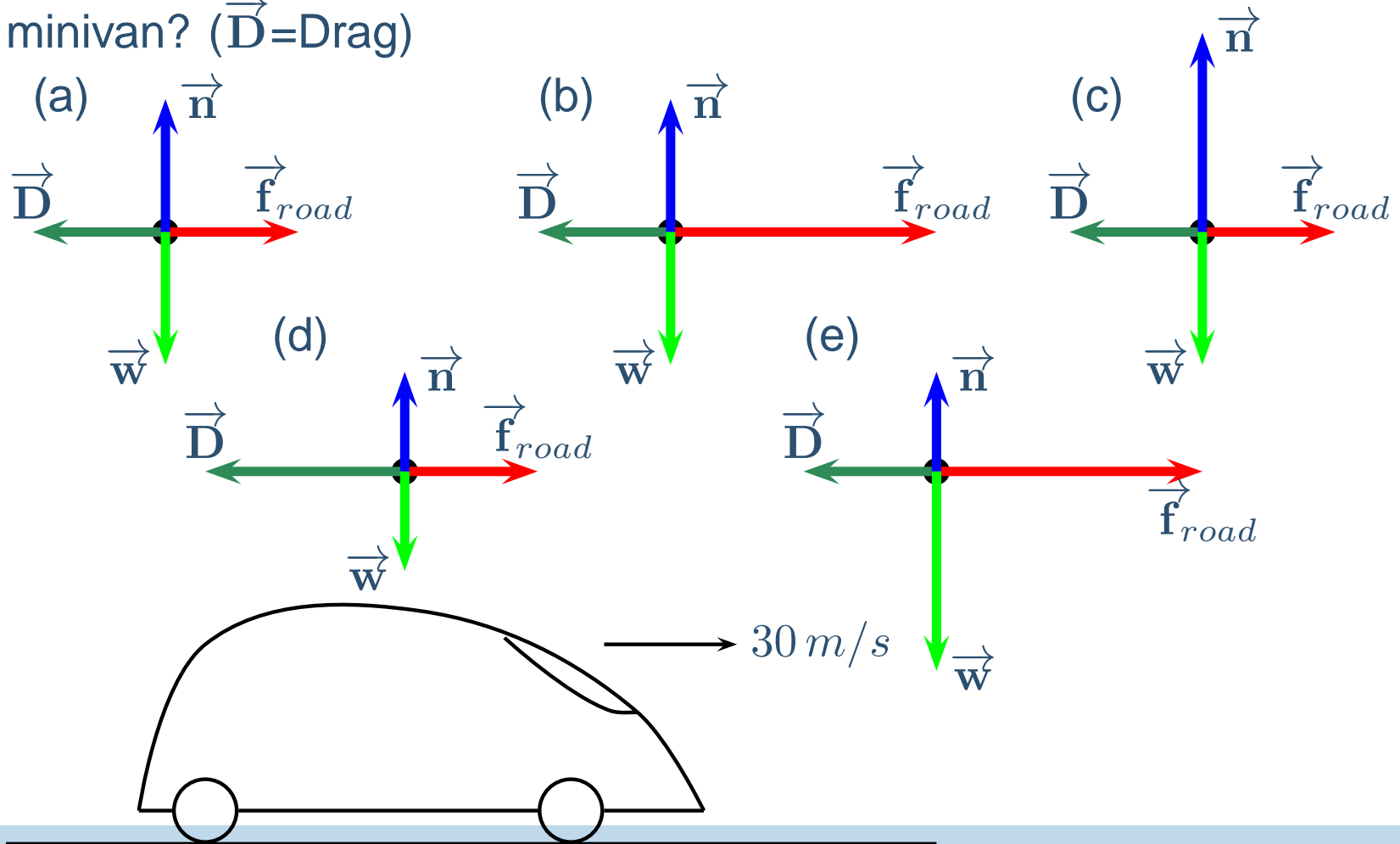
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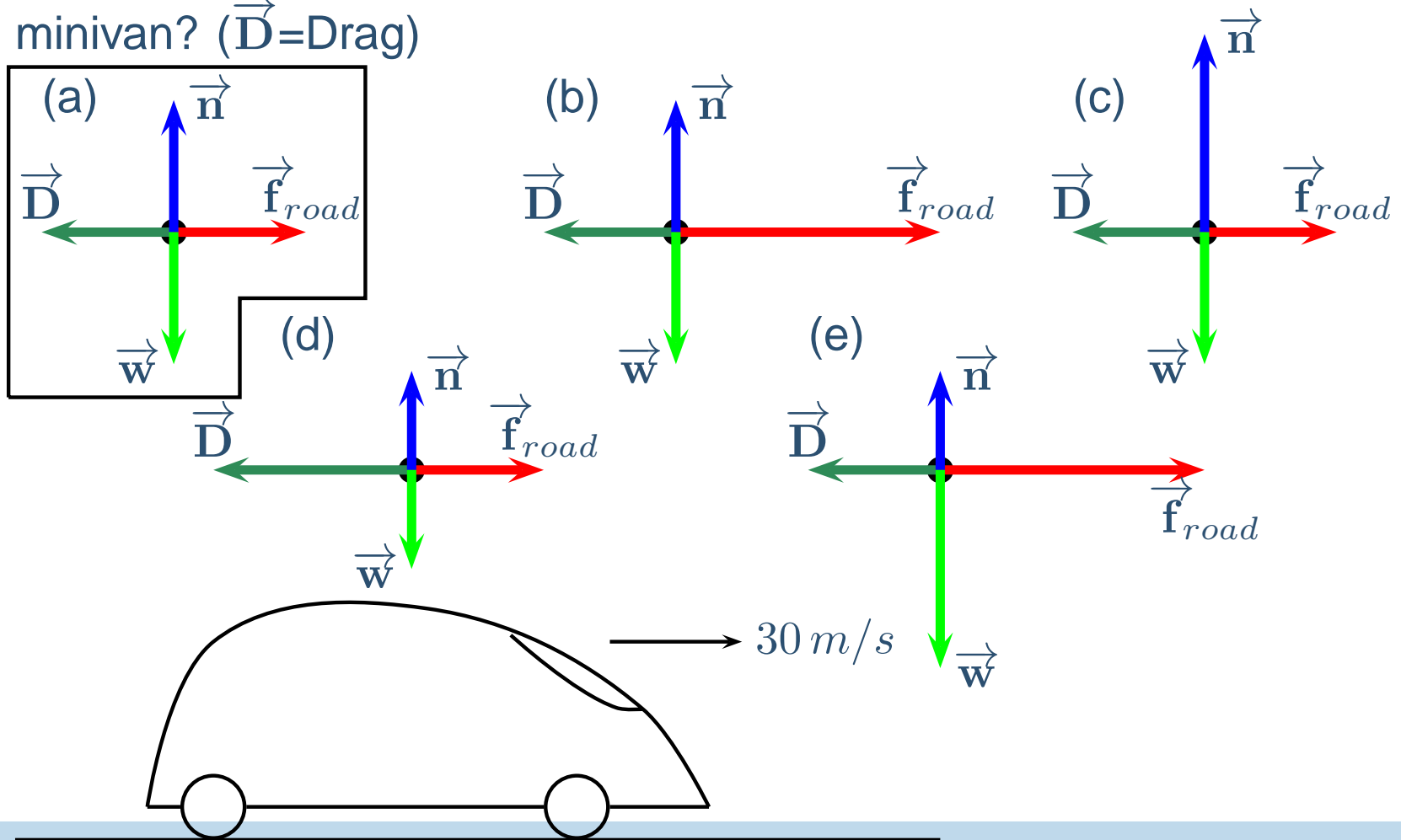
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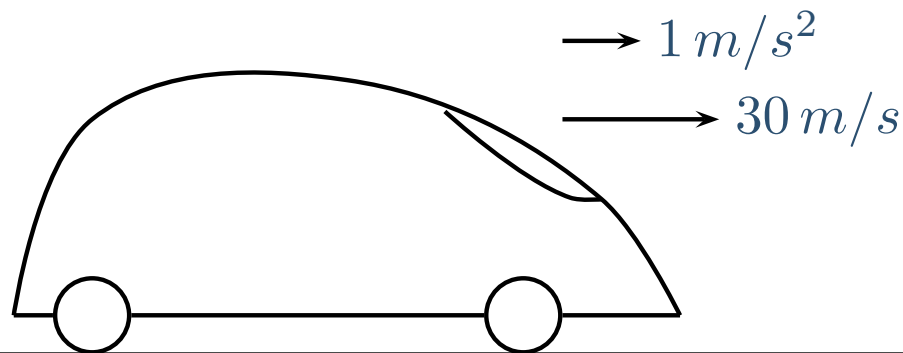
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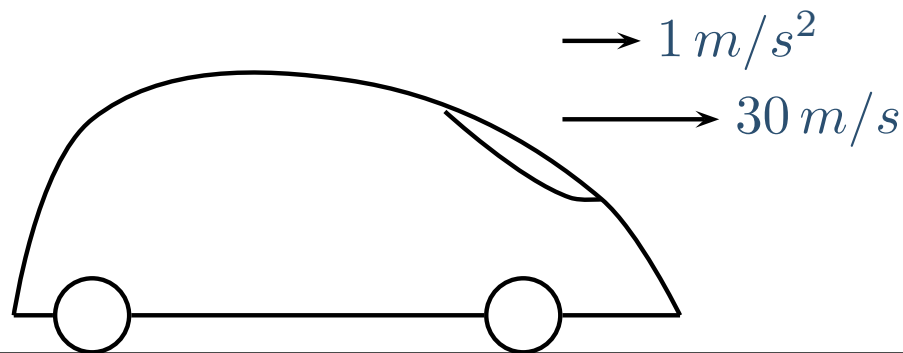
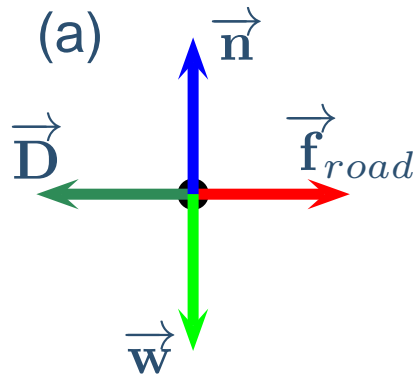
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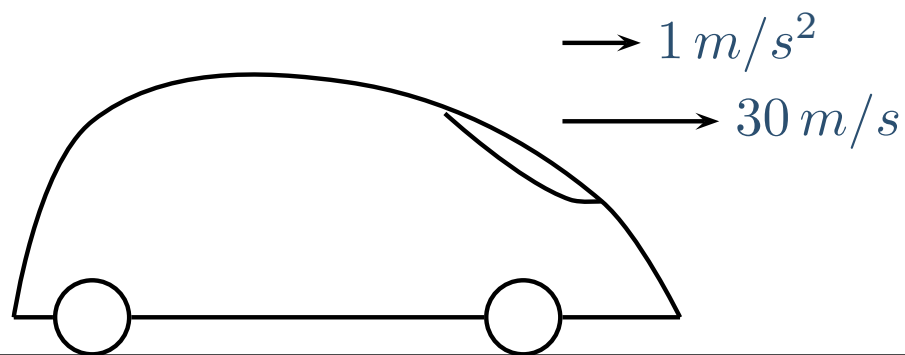
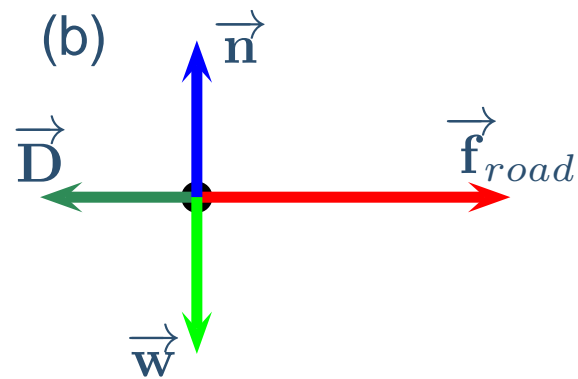
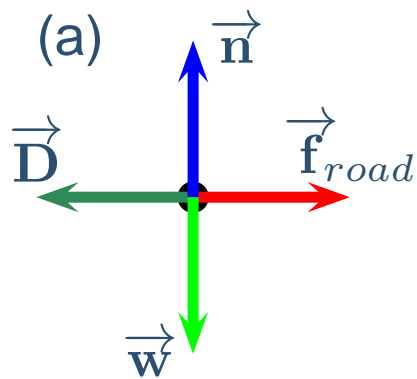
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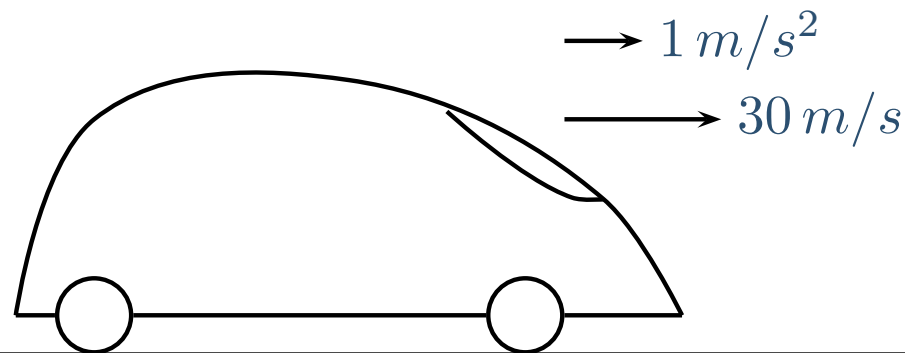
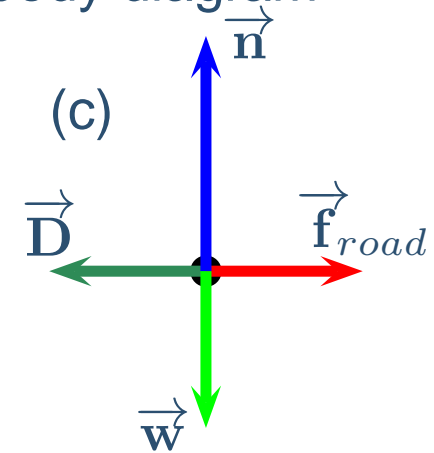
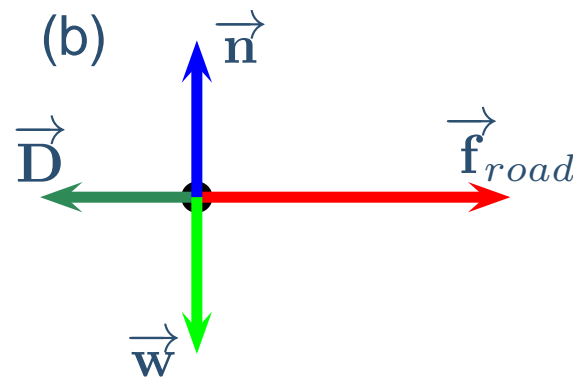
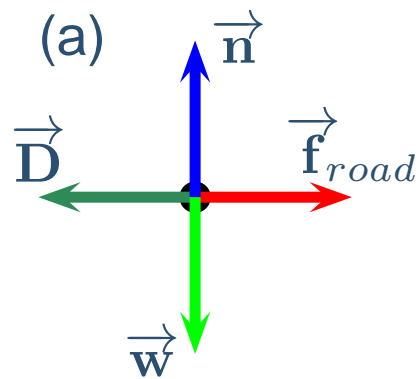
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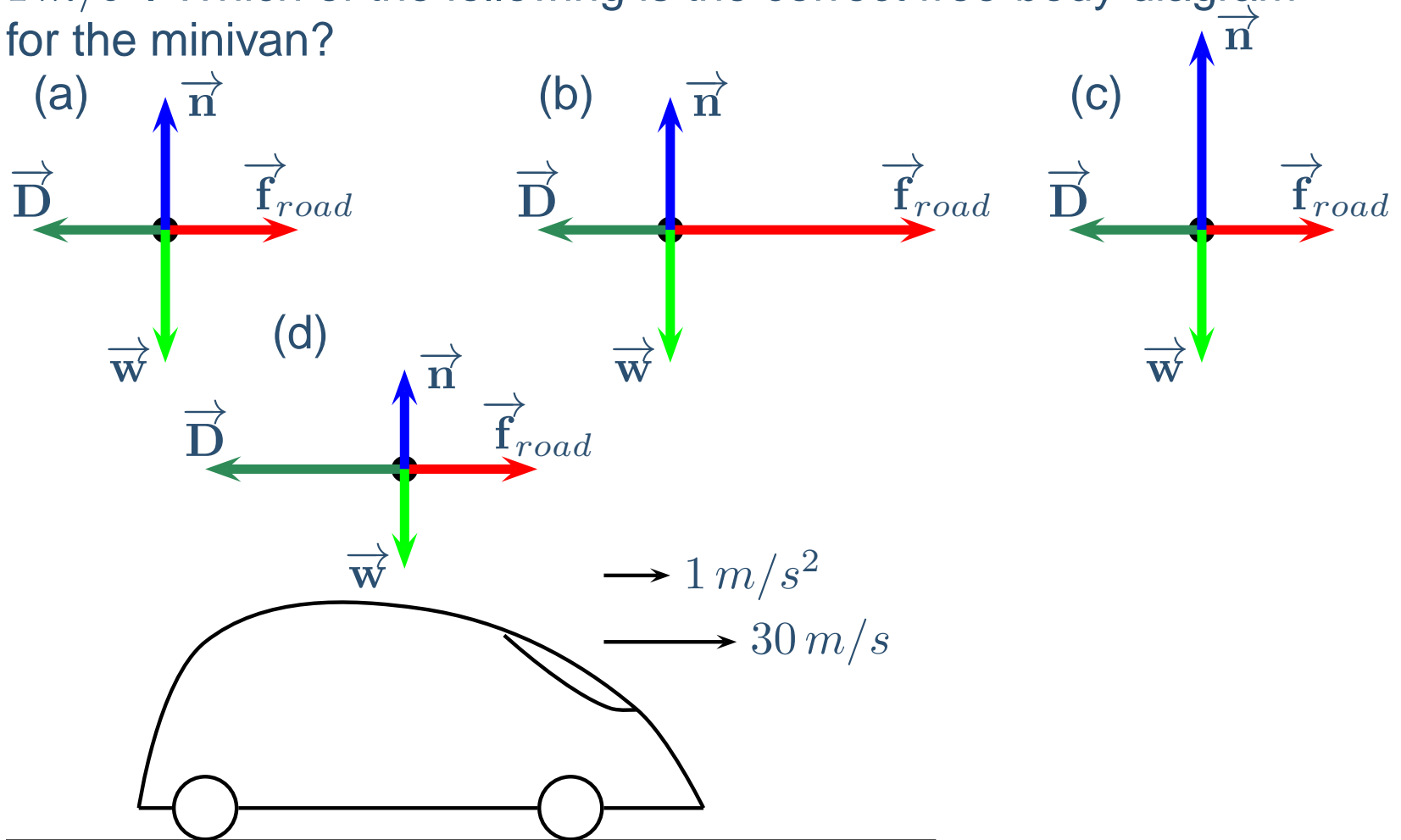
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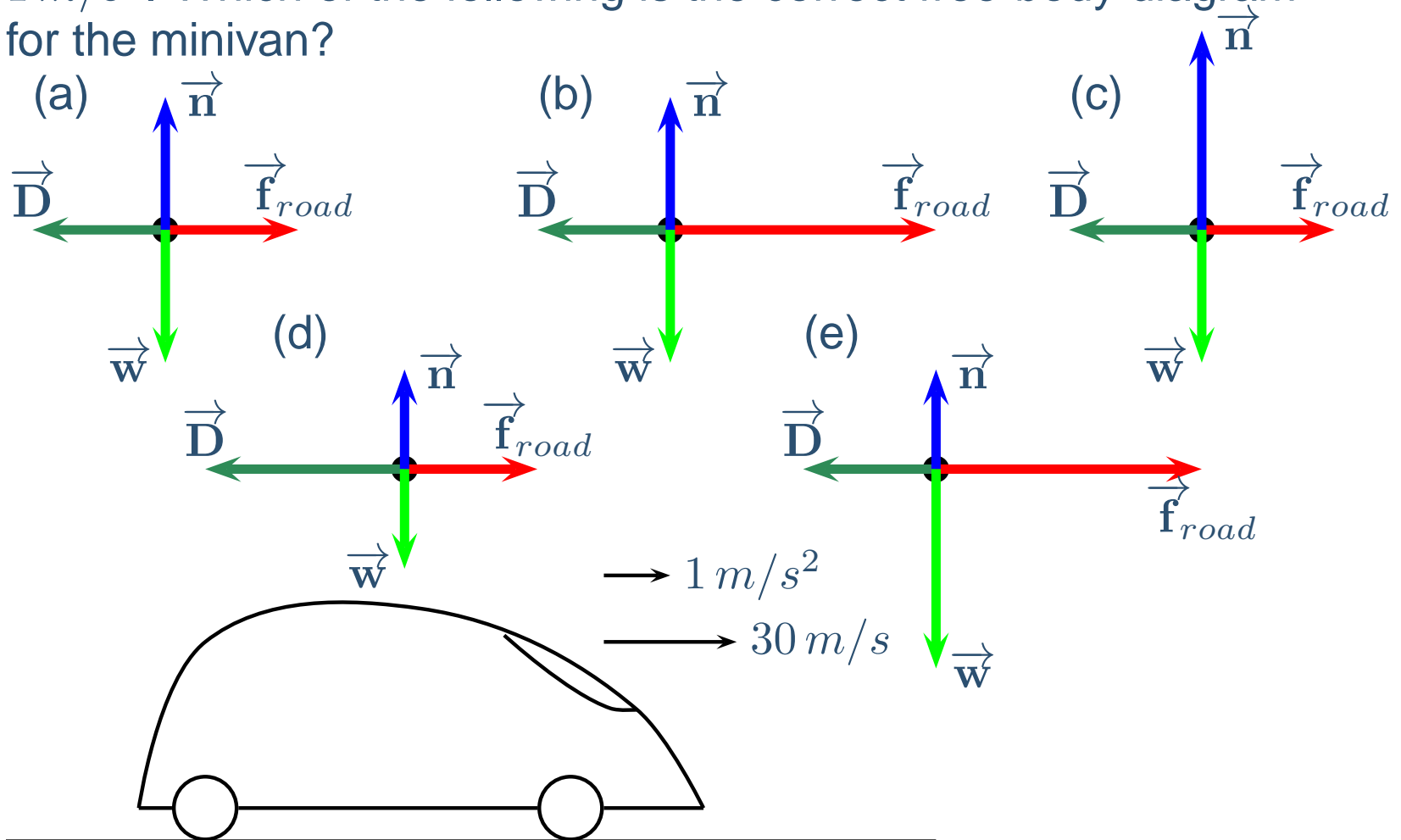
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