February 22, Week 6

Today: Chapter 5, Applying Newton's Laws

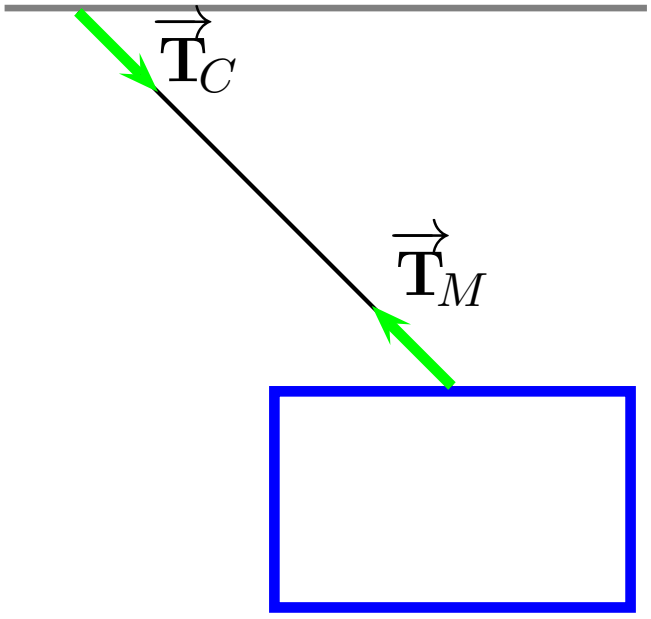
Exam #2, Friday, February 24 covers Chapter 1 and 3.

Review Session, Thursday, February 23, 7:30PM in room 103 of Regener Hall

Chapter 3 review questions on Mastering Physics.

Massless Ropes

Massless ropes have the very useful property that the tension on each side must always be equal.



$\overrightarrow{\mathbf{T}}_M =$ force on mass due to bottom of rope

$\overrightarrow{\mathbf{T}}_C =$ force on ceiling due to top of rope

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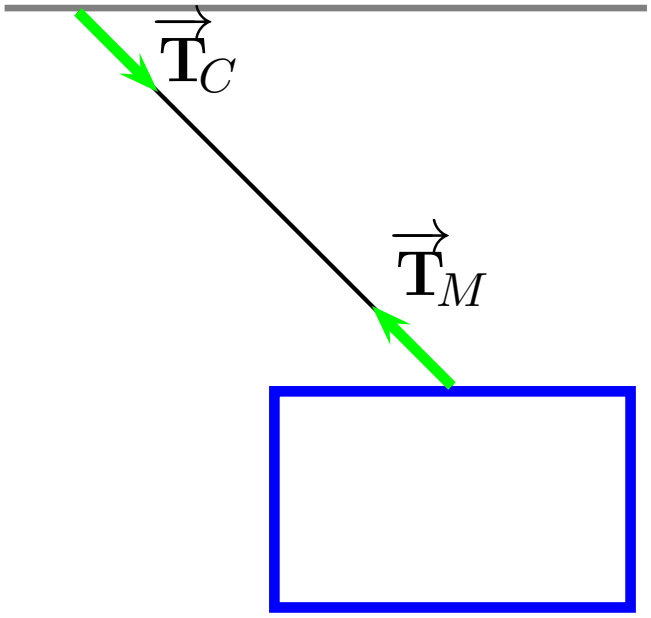

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$T_M = T_C$

Pulleys

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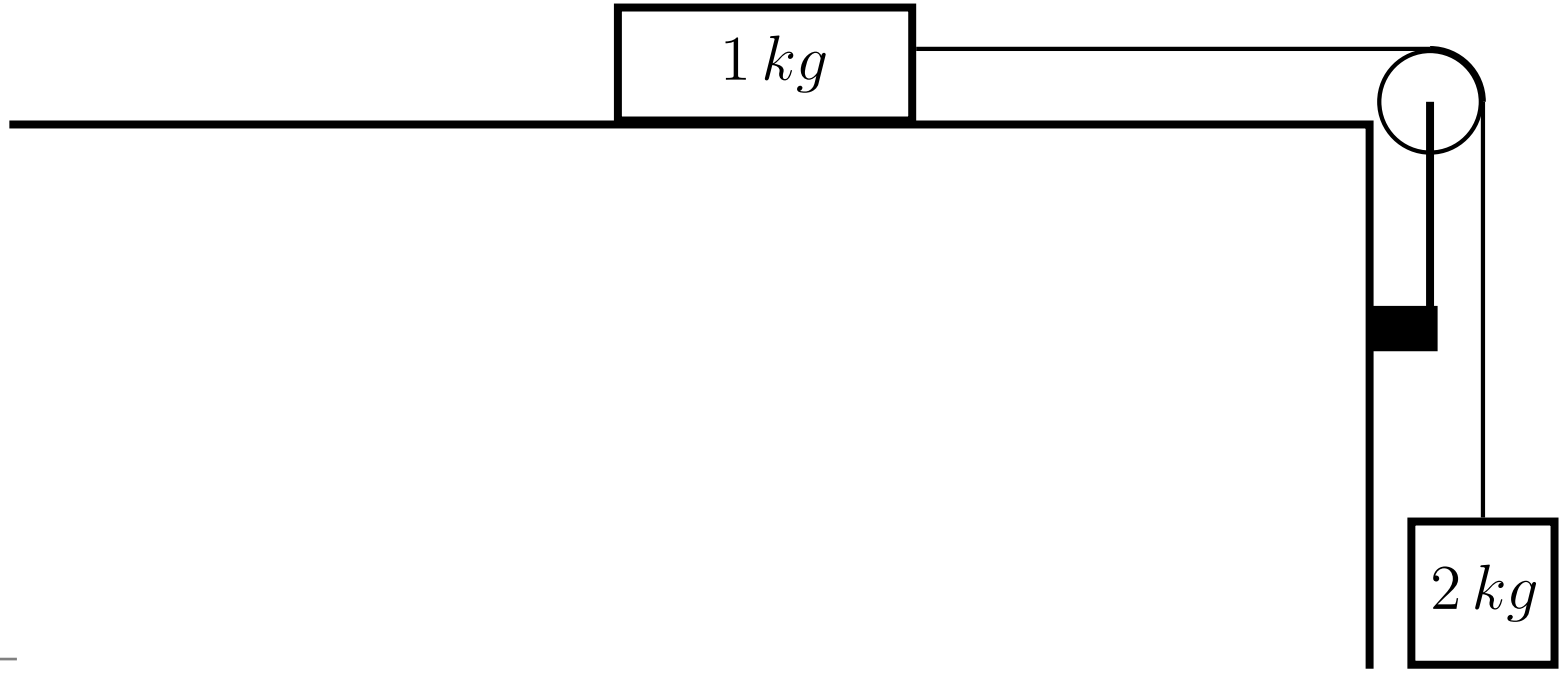
Example: A $1\,kg$ mass is placed on a horizontal, frictionless table. It is connected, by a massless rope and over a perfect pulley, to a $3\,kg$ mass. The masses are released from rest. If we ignore air resistance, what is the tension in the rope and the acceleration of the masses?

Clicker Quiz

A $1\,kg$ mass is placed on a horizontal table. It is connected, by a massless rope and over a perfect pulley, to a $2\,kg$ mass. If, after being released from rest, both masses move with constant speed, what is the magnitude of the frictional force between the $1\,kg$ mass and the table?



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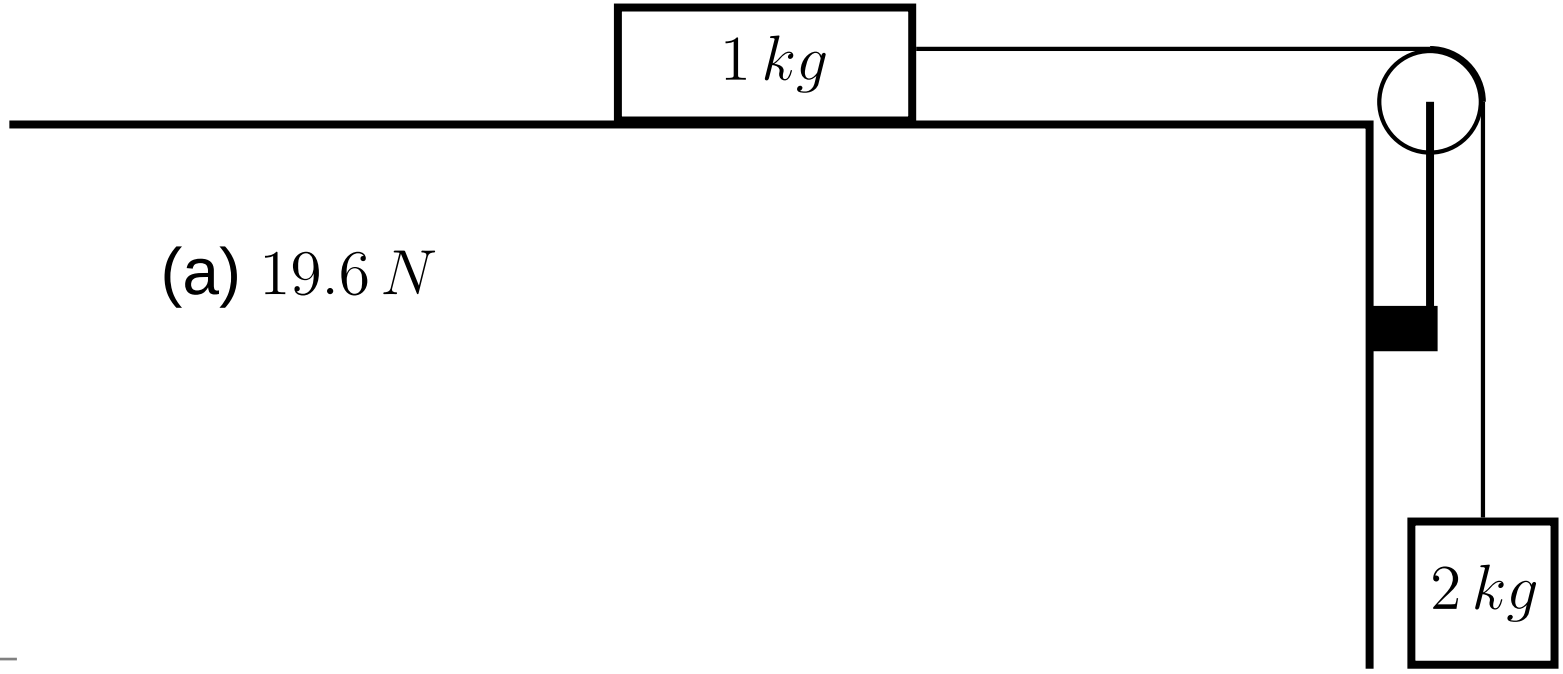

(a) $19.6\,N$

Clicker Quiz

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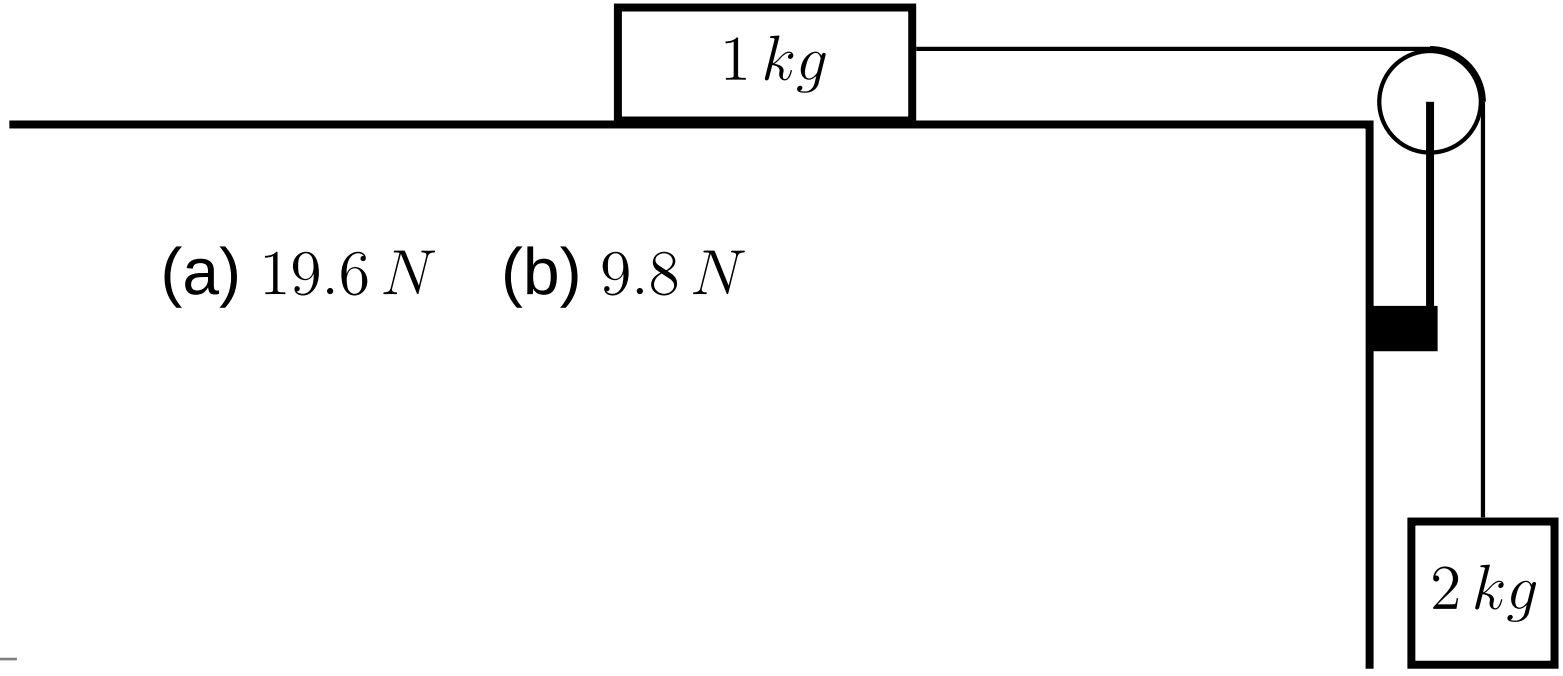

(a) $19.6\,N$ (b) $9.8\,N$

Clicker Quiz

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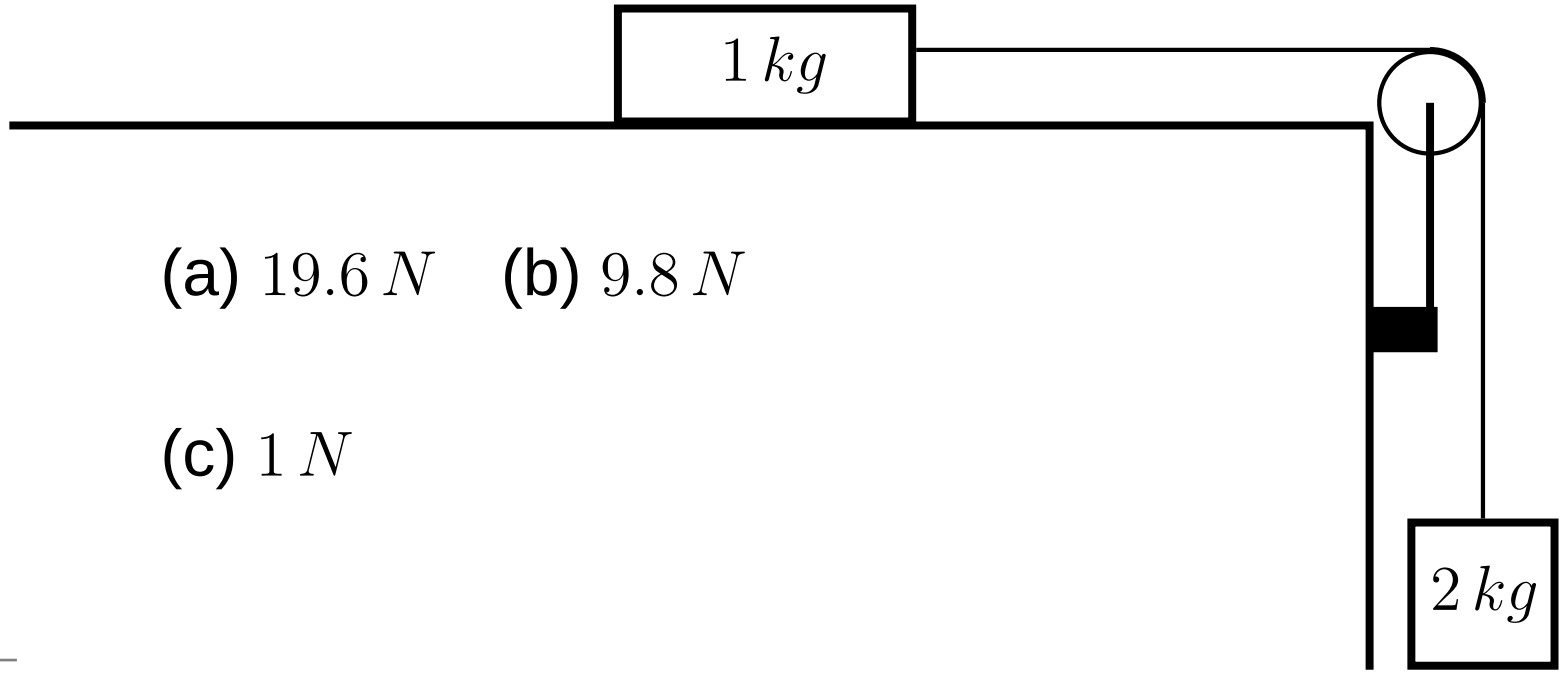

(a) $19.6\,N$ (b) $9.8\,N$

(c) $1\,N$

Clicker Quiz

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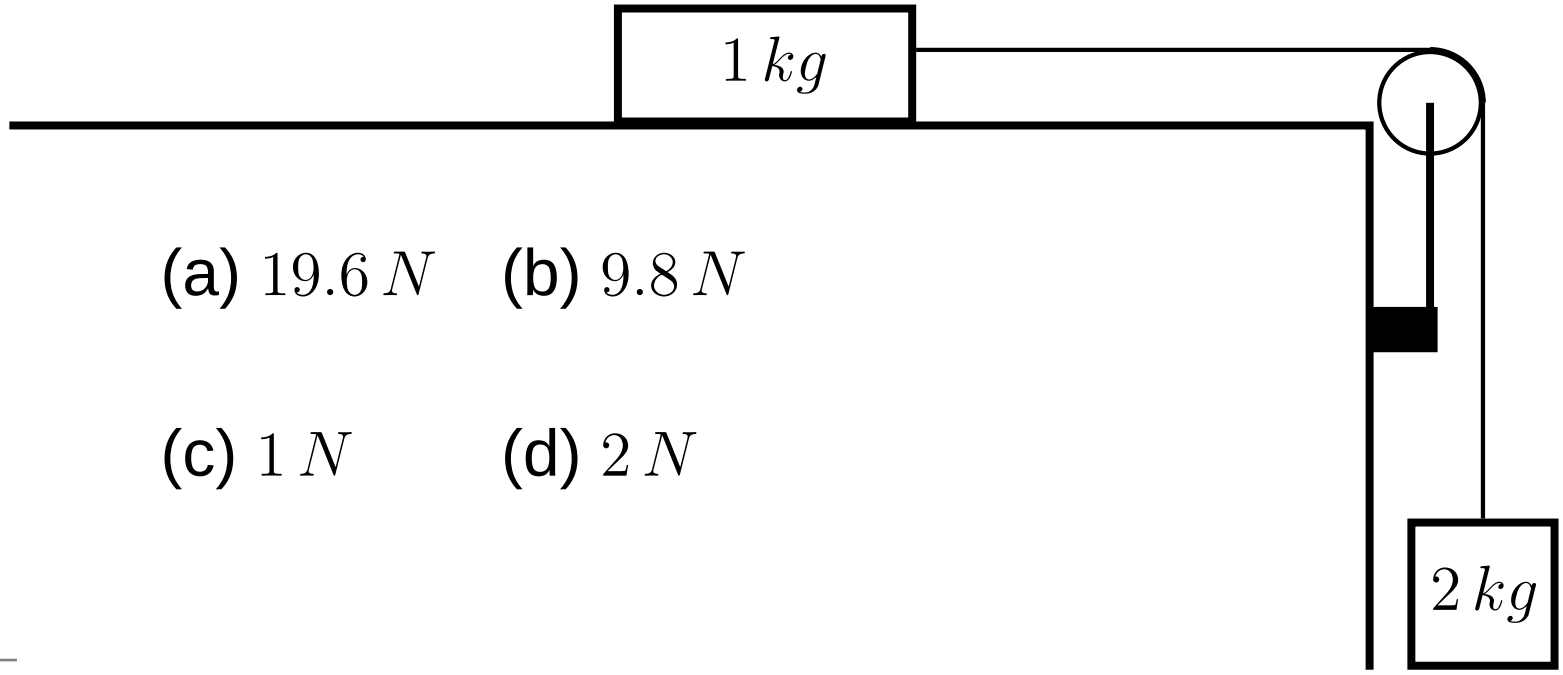

(a) $19.6\,N$ (b) $9.8\,N$

(c) $1\,N$ (d) $2\,N$

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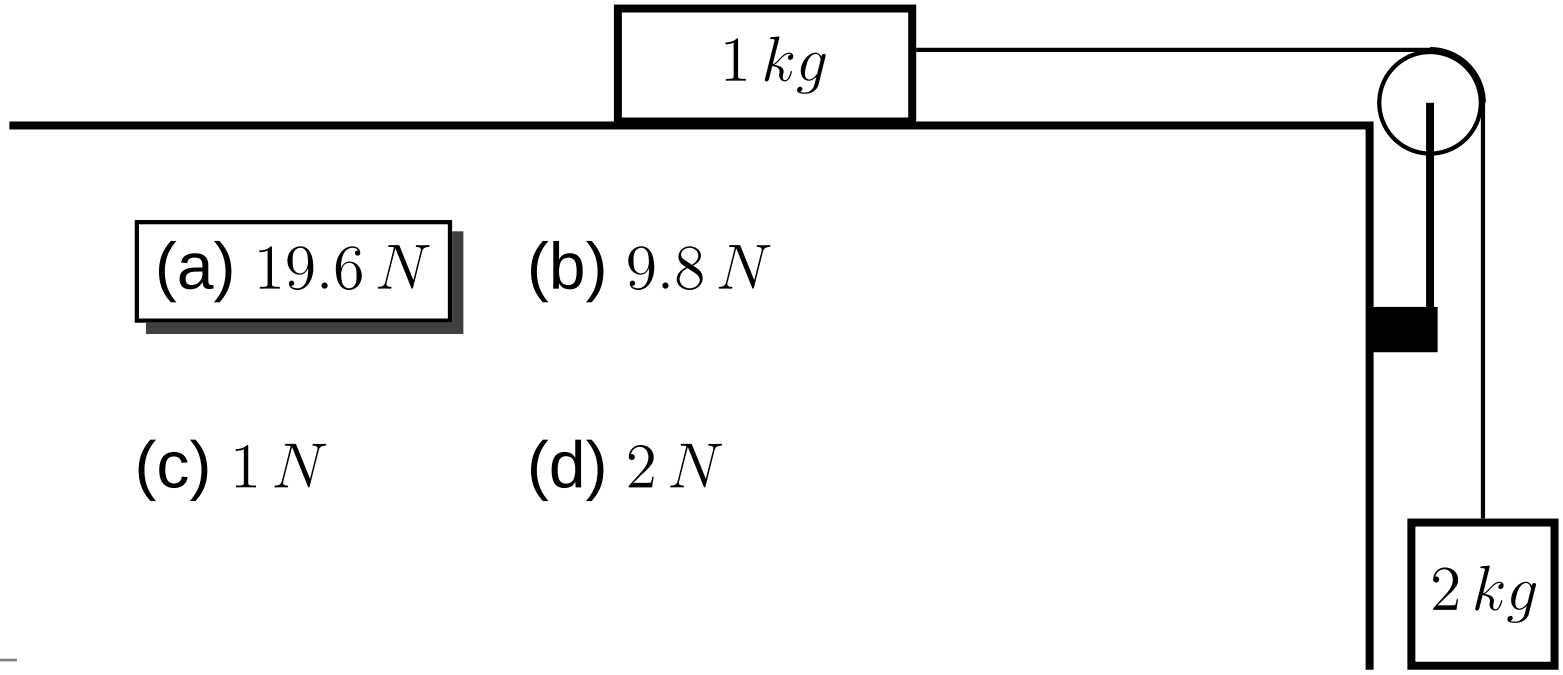

(a) $19.6\,N$ (b) $9.8\,N$

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