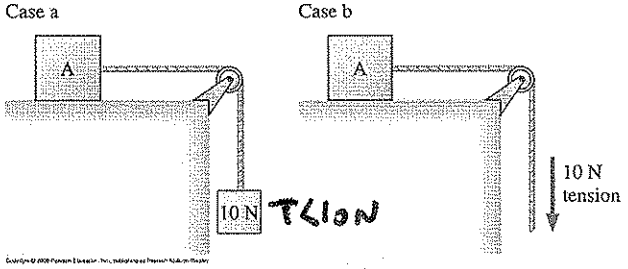
Two separate cases are shown below. In Case (a), the top block is accelerated across a frictionless table by a hanging 10 N weight. In Case (b), the same top block is accelerated by a steady 10 N tension in the string. Which of the following statements about the tension in the string are true?



A. the tension in Case (a) is greater
B. the tensions are equal in both cases
C. the tension in Case (b) is greater
D. the tension in Case (a) is zero

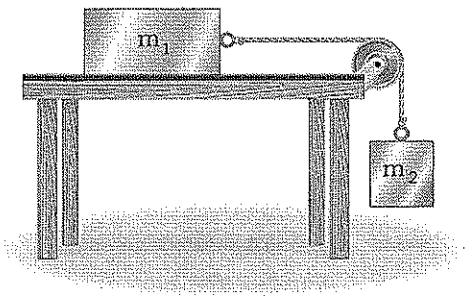
You are correct. Your receipt no. is 158-2021

Which of the following statements about the acceleration of the top block are true?

A. the acceleration in Case (a) is greater
B. the acceleration in Case (a) is zero
C. the acceleration in Case (b) is greater
D. the accelerations are equal in both cases

You are correct. Your receipt no. is 158-2649

An $m_1 = 3.59$ kg block on a smooth tabletop is attached by a string to a hanging block of mass $m_2 = 2.77$ kg, as shown in the figure below.



The blocks are released from rest and allowed to move freely. Calculate the acceleration of the blocks.

4.27 m/s²

Tries 0/99

What is the tension in the string?

15.3

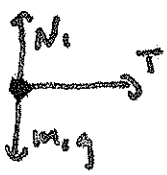
Tries 0/99

G) Pulley + tension, $a = -g$, Newton II

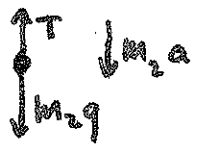
known	unknown	estimate
$M_1 = 3.59$kg	$a = ?$	$a = \frac{g}{2} = 4.9$ m/s²
$M_2 = 2.77$kg	$T = ?$	$T = ma = 3.6 \cdot 4.9 = 18$ N

$m_2 a$

D)



$\sum F_{x,y} = ma_{x,y}$



A) $T = m_1 a$ and $m_2 a = m_2 g - T$

eliminate T and solve for a

$m_2 a = m_2 g - m_1 a$

$a = \frac{m_2 g}{m_1 + m_2} = \frac{2.77\text{kg} \cdot 9.8\text{m/s}^2}{2.77\text{kg} + 3.59\text{kg}}$

$a = 4.27$ m/s²

$T = m_1 a = 3.59\text{kg} \cdot 4.27\text{m/s}^2$

$T = 15.3$ N

L) units are correct;
The estimate is pretty close.