

Reflection and Self-Assessment**Part 1:** Circle the statement that best describes how you completed the practice:

- I answered all questions without using the online solutions. I checked my answers against the key at the back of the practice and was able to determine my mistakes and correct them without referring to the online solutions.
- I answered most questions correctly without using the online solutions. I used the online solutions to help me with some questions and was able, with help from the online solutions, to understand every question and answer them correctly.
- I used the online solutions to help me with most of the questions. I was able, with help from the online solutions, to understand each question and answer them correctly.
- Even using the online solutions, I was not able to fully understand the solution to some problems. The questions I had trouble with were:

- I did not attempt all the questions on the practice.

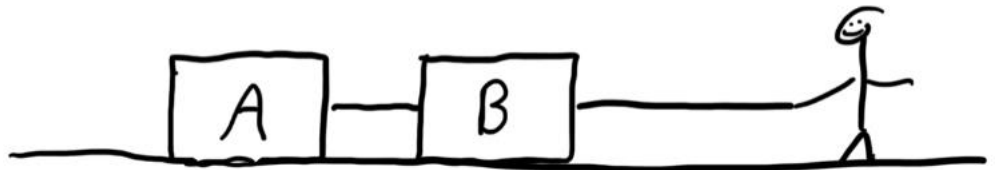
Part 2: Circle the statement that best describes your confidence in answering questions of this type in the future.

- I am confident I can answer nearly any question of this type correctly without using notes or other assistance.
- I am confident I can answer **MOST** questions of this type correctly without using notes or other assistance.
- I am **NOT** confident I can answer most questions of this type correctly without using notes or other assistance.

Part 3: Circle the statement below that best describes the total amount of time you spent actively working on this practice:

| | | | | |
|-------------------|---------------------------|-----------------------------|------------------------------|----------------------|
| Less than an hour | Between one and two hours | Between two and three hours | Between three and four hours | More than four hours |
|-------------------|---------------------------|-----------------------------|------------------------------|----------------------|

1. A person pulls two blocks connected by a rope over a flat frictionless surface, causing them to accelerate. Complete the FBDs for each block showing the forces acting on it.



BLOCK A:



BLOCK B:



4. A person pulls two blocks one with a mass of 14 kg and the other with a mass of 21 kg over a surface with $\mu = 0.14$ at a constant velocity.
- What is the acceleration of the blocks?
 - What is the net force acting on the blocks?
 - What is friction force acting on the 14 kg block?
 - What is the friction force acting on the 21 kg block?
 - What is the total friction acting on the blocks?
 - What is the force the person is pulling with?

5. A person pulls two blocks one with a mass of 18 kg and one with a mass of 14 kg over a frictionless horizontal surface with a force of 22 N.



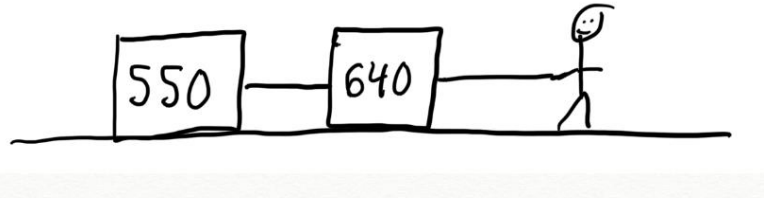
- a. What is the total mass of the blocks?
- b. What is the net force acting on the blocks?
- c. What is the acceleration of the blocks?
- d. The only horizontal force affecting the 18 kg block is tension. Determine the tension force acting on that block.

6. A person pulls three blocks one with a mass of 5.0kg, one with a mass of 18 kg, and one with a mass of 14 kg over a frictionless horizontal surface with a force of 22 N.



- What is the total mass of the blocks?
- What is the net force acting on the blocks?
- What is the acceleration of the blocks?
- The only horizontal force affecting the 5 kg block is tension. Determine the tension force acting on that block.
- Determine the net force acting on the 18 kg block using Newton's 2nd Law.
- Determine the tension between the 18kg block and the 14 kg block.

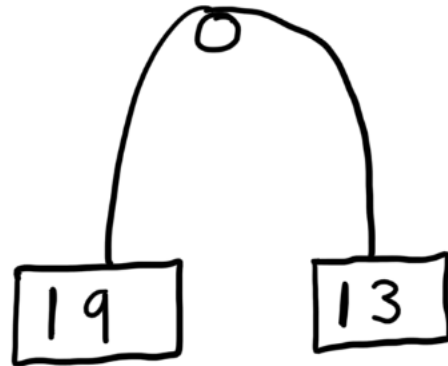
7. A 550 kg and 640 kg block are connected with a rope and pulled with a force of 7500 N over a surface with μ of 0.22.



- What is the total mass of the blocks?
- What is the total friction force of the blocks?
- What is the net force of the system?
- What is the acceleration of the blocks?
- Draw a FBD of both blocks.
- Determine the tension in the rope connecting the two blocks.

11. A 19 kg mass and a 13 kg mass are hung on opposite sides of a frictionless pulley. Then the masses are allowed to fall freely.

- a. What will happen to the 19 kg mass?
- b. What will happen to the 13 kg mass?
- c. What is the net force acting on the system?
- d. What is the acceleration of the system?
- e. What is the tension in the rope?
- f. If the 19 kg mass starts 1.0 m above the ground, how long will it take until it hits the ground?

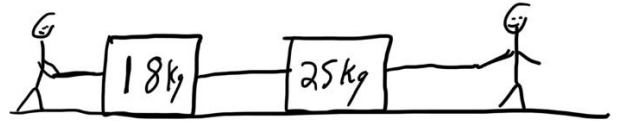


12. A 46 kg Spider Man jumps off a tall building, falls for 1.0 seconds, then shoots a web and uses it to slow himself to a stop vertically in 0.50 seconds. What is the tension in the web?

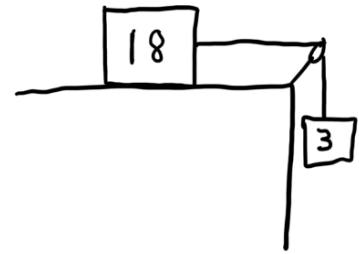
Tension Practice

Name: _____

13. An 18 kg and a 25 kg block are connected with a rope on a frictionless surface. One person pulls the 18 kg block to the left with a force of 87 N, another person pulls the 25 kg block to the right with a force of 46 N. What is the tension in the rope connecting the two blocks?



14. A 3.0 kg block hangs over the edge of a table, it is connected to an 18 kg block on the table. The coefficient of friction between the table and the 18 kg block is 0.11.



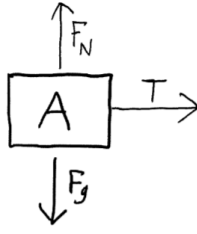
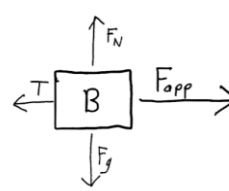
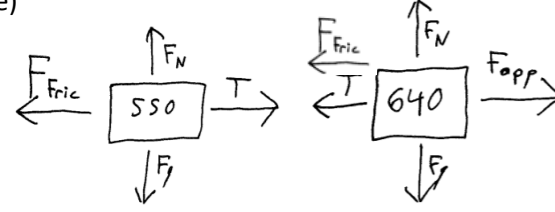
- a. What is the gravitational force pulling the blocks downward?
- b. What is the frictional force slowing the motion of the blocks?
- c. What is the net force acting on the blocks?
- d. What is the acceleration of the blocks?
- e. What is the tension in the rope?

15. An 8.0 kg block is on a table connected to a free hanging 11 kg mass, and a free hanging 14 kg mass on opposite sides of the table. What is the minimum coefficient of friction between the table and the 8.0 kg block if the blocks do not move?



Tension Practice

Name: _____

| Answer Key | | | | |
|--|--|---------------------------------------|--------------------------|--|
| 1a)  | 1b)  | 2) 1.4 m/s^2 | 3a) 22 N | 3b) 0.88 m/s^2 |
| 4a) 0 m/s^2 | 4b) 0 N | 4c) 19 N | 4d) 29 N | 4e) 48 N |
| 4f) 48 N | 5a) 32 kg | 5b) 22N to the right | 5c) 0.69 m/s^2 | 5d) 12 N |
| 6a) 37 kg | 6b) 22 N | 6c) 0.59 m/s^2 to the right | 6d) 3.0 N | 6e) 11 N |
| 6f) 14 N | 7a) 1200 kg | 7b) 2600 N | 7c) 4900 N | 7d) 4.1 m/s^2 |
| 7e)  | | 7f) 3500 N | 8) 9100 N | 9) 25 N |
| 10) 25 N | 11a) It will fall | 11b) It will be lifted | 11c) 59 N | 11d) 1.8 m/s^2 in 19kg block direction |
| 11e) 150 N | 11f) 1.0 seconds | 12) 1400 N | 13) 7.0×10^1 N | 14a) 29 N |
| 14b) 19 N | 14c) 1.0×10^1 N | 14d) 0.48 m/s^2 | 14e) 28 N | 15) 0.38 |