



Using a Newton's 2<sup>nd</sup> Law literal equation, applied to the modified atwood machine, calculate the acceleration of the system, in each of the four scenarios. Show your work below.

Scenario 1

Scenario 2

Scenario 3

Scenario 4

Acceleration with Newton's 2<sup>nd</sup> Law:

	Heavier	Lighter				
Scenario	Cup 1	Cup 2	Cart	Total Mass	Net Force	Acceleration
1						
2						
3						
4						

Find the percent difference in the kinematics acceleration (experimental) and the Newton's 2<sup>nd</sup> Law acceleration (actual) for all three scenarios.

$$\%error = \left( \frac{Actual - Experimental}{Actual} \right) \times 100\%$$

Scenario 1: \_\_\_\_\_% Scenario 2: \_\_\_\_\_% Scenario 3: \_\_\_\_\_% Scenario 4: \_\_\_\_\_%

Why are there discrepancies between the actual and the experimental accelerations? Describe at least two potential sources of error. Answer with complete sentences.

What happened to the acceleration as mass was added? Did net force change? Explain.