# QUIZ 05: STATIC AND KINETIC FRICTION

Answer the questions using your clicker. If there are no multiple choices, the question is true/false. Use the T and F keys to respond. Please do not mark on this quiz paper. Each question is worth 3 points.

The table on the right summarizes data collected for the cart pulled by hand.

Cart M (kg)	Maximum Tension (N)	μ_s
0.705	2.77	0.401
1.205	4.66	0.395
1.705	6.20	0.371
2.205	8.38	
2.705		0.416

1. The maximum possible amount of static friction acting on an object will be, *by definition*

    A) $f_s = \mu_s$

    B) $f_s = \mu_s(mg)$

    C) $f_s = \mu_s N$

    D) $f_s = \dfrac{T}{mg}$

2. To calculate the coefficient of static friction, use

    A) $\mu_s = T - mg$

    B) $\mu_s = mg$

    C) $\mu_s = \dfrac{mg}{T}$

    D) $\mu_s = \dfrac{T}{mg}$

3. For the **fourth** static trial, calculate the coefficient of static friction μ_s. $\mu_s = 0.388$

4. For the **fifth** trial, what was the maximum **tension** in the string? **T = 11.0 N**

5. What is the **average** coefficient of static friction? $\mu_s = 0.394$

6. True or **false**: The coefficient of static friction μ_s should increase as more mass is added to the cart.

The graph below results when a cart with a mass of **0.905kg** is pulled down the track with an acceleration **a = 0.177m/s²**.
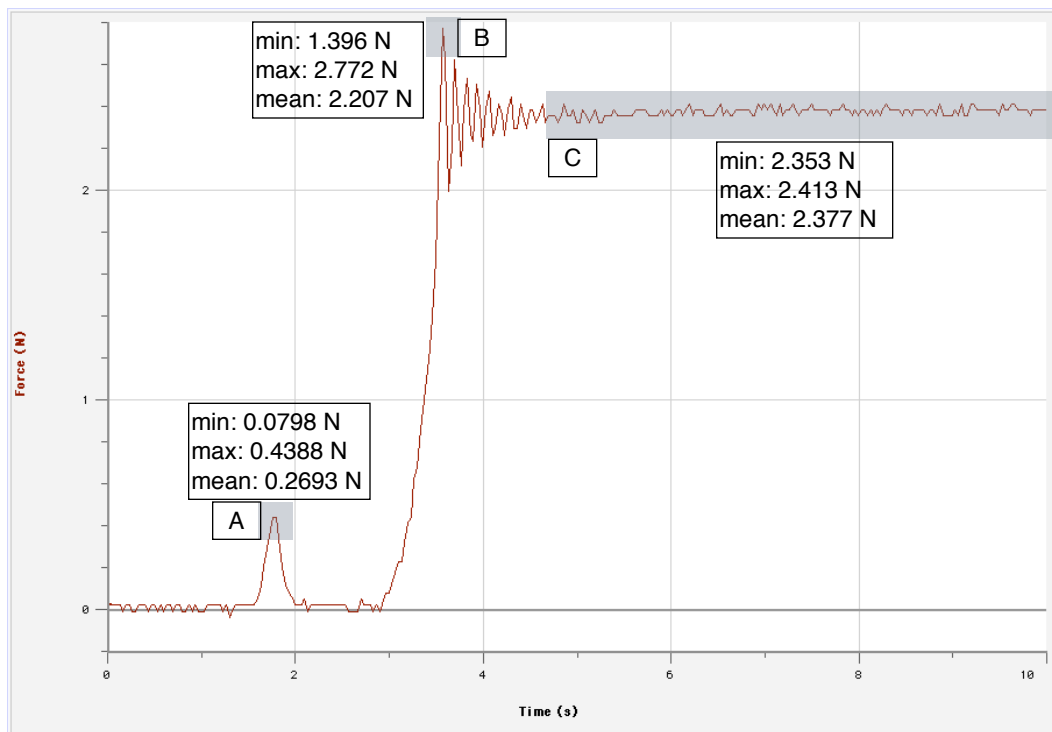
7. At which of the marked points does the cart begin to move? **B**

8. What is the coefficient of kinetic friction μ_k for this trial? $\mu_k = 0.328$

9. What is wrong with this value?

    A) Nothing. The kinetic coefficient should be smaller than the static coefficient.

    B) The kinetic coefficient should be larger, but unless we have several data to average, we don't know if this one value is just a case of random error.

    C) It is not possible to draw any conclusions from a single value; the kinetic coefficient might be smaller or larger than the static coefficient, but until we have more data, there's no way to know which it will be.

10. True or **false**: If you repeated this trial three times, you would expect the kinetic coefficient to be identical each time.