Braking Individual Activity            ID: _____            Name:_____



You have been hired as an automotive engineer to gather information about two braking systems, ABS and Non-ABS.  The vehicle used to test the systems has an overall mass of _____ kg.   The initial velocity from which the vehicle will begin braking is _____ m/s.   The static coefficient of friction (i.e. ABS System) between the tire and road is _____.   The kinetic coefficient of friction (i.e. Non-ABS System) between the tire and road is _____. Carry the decimal to the hundredths place. g = -10

1.  Draw a qualitative force diagram for the vehicle during braking:

2.  Calculate the force gravity magnitude on the vehicle: _____ N

3.  Calculate the force normal magnitude on the vehicle: _____N

4.
    a.  Calculate the static force friction magnitude (i.e. ABS): _____N

    b.  Calculate the kinetic force friction magnitude (i.e. Non-ABS): _____N

5. A. What is the acceleration magnitude of the vehicle with ABS? _____ m/s/s




B. What is the acceleration magnitude of the vehicle with Non-ABS? _____ m/s/s




6. a. Calculate the time to come to a stop using ABS: _____ seconds




b. Calculate the time to come to a stop using Non-ABS: _____ seconds




7.

a. Calculate the distance required to stop with ABS: _____ meters




b. Calculate the distance required to stop with Non-ABS: _____ meters




Which system has a shorter stopping distance?          ABS          Non-ABS