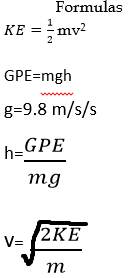
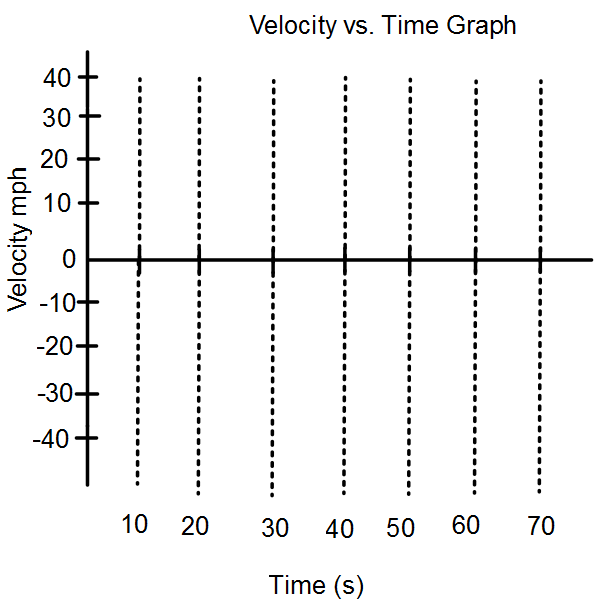
1. A car was stopped at a stoplight for 10 seconds. The car takes 10 seconds to speed up to a velocity of 30 mph to the right. It then traveled for 20 seconds at 30 miles per hour. The car slows to a stop over a 10 second time period. The car remains stopped for 10 seconds before reversing direction and speeding up to 20 mph in 10 seconds. Draw this car’s journey:

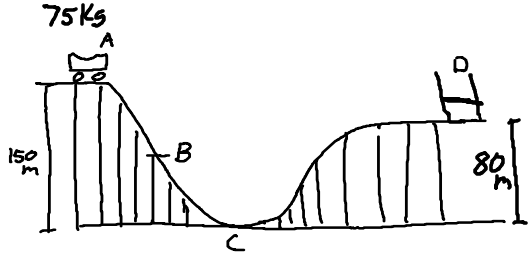




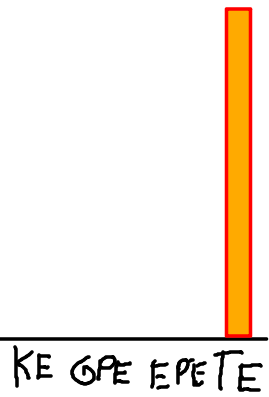
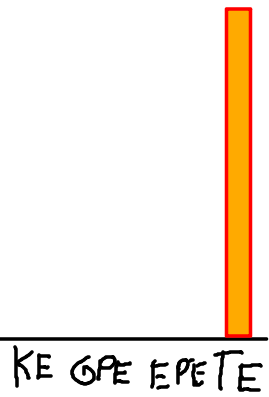
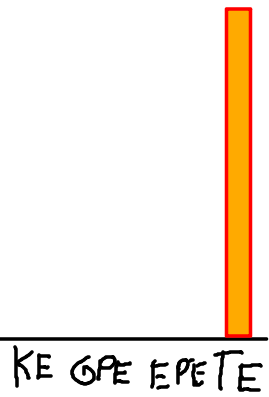
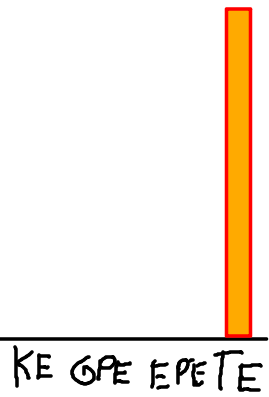
The following graph shows the velocity of a cart on a frictionless surface.  The cart is initially pushed by a hand then later comes into contact with an elastic band.

1. Identify the time periods for the following:
   1. The hand is in contact with the cart \_\_\_\_\_\_\_s to \_\_\_\_\_\_\_s
   2. The cart is in contact with the elastic band \_\_\_\_\_\_\_s to \_\_\_\_\_\_\_s
   3. The cart is speeding up and moving to the left \_\_\_\_\_\_\_s to \_\_\_\_\_\_\_s
   4. The cart is speeding up and moving to the right \_\_\_\_\_\_\_s to \_\_\_\_\_\_\_s
   5. When the cart changes direction \_\_\_\_\_\_\_s to \_\_\_\_\_\_\_s
   6. When the cart is slowing down \_\_\_\_\_\_\_s to \_\_\_\_\_\_\_s
   7. When 2 energy transfers are taking place. \_\_\_\_\_\_s to \_\_\_\_\_s and \_\_\_\_\_s to \_\_\_\_\_s
2. Give a description of all of the energy transfers (from object to object) taking place. Include the following terms (Energy Giver, Energy Receiver, Hand, Cart, Elastic Band)
3. Give a description of all of the energy conversions (types of energy) taking place. (Chemical Potential Energy, Kinetic Energy, Elastic Potential Energy).
4. What is the Kinetic Energy of the cart at the instant before it hits the elastic band?
5. What is the Elastic Potential Energy of the cart at the instant the cart is changing direction? (the cart at this instant has no velocity)
6. Does the cart have more kinetic energy at 5 seconds or 12 seconds? Explain your reasoning
7. Draw a graph to represent the Elastic Potential Energy in the cart band system.

EP E



1. At point A of the Coaster/Cart/Elastic Band System what is the GPE of the cart?
2. Assuming this is a frictionless track what is the Kinetic Energy at point C?
3. What is the velocity of the cart at point C?
4. What is the Gravitational Potential Energy of the cart at point D?
5. What is the Elastic Potential Energy of the Elastic Band at point D at the instant the cart is changing direction? (The cart at this instant has no velocity)
6. If the cart has 55,125 J of GPE at point B at what height is the cart?
7. What is the Kinetic Energy of the cart at point B?
8. Complete the Energy Bar Graphs for the cart band System for the following points:

A

B

D

C