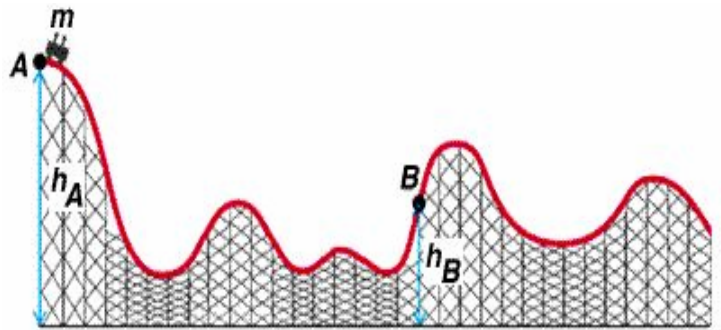


### Physics 151 Class Exercise: Energy

1. (a) A 236 kg roller coaster car is released from rest from position A where  $h_A = 40$  m. What is the velocity of the car when it gets to position B where  $h_B = 18$  m? You should work this part of the problem with the ZLP at ground. There is no friction in this problem.



Answer:

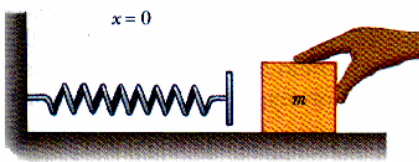
(b) Rework part (a) with the ZLP at the level of position B.

Answer:

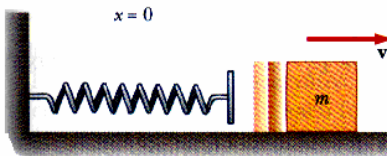
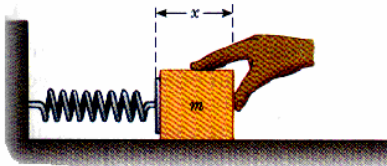
(c) Imagine instead that the car rounded position A with a velocity of 15 m/s. What would be the velocity in this instance when the car reaches position B?

Answer:

2. A 12 N/m horizontal spring on a frictionless surface is shown in the first panel of the illustration in its equilibrium position. A 1.2 kg mass is pushed against the spring compressing it a distance of  $x = 8.2$  cm in the second panel.



(a) The hand is then quickly removed? What will be the velocity of the mass when it reaches the equilibrium position?



Answer:	
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(b) What velocity did the mass have at  $x = 6.0$  cm along the way?

Answer:	
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