

## Week 12 - Work, Energy, and Power

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### Read Page 157-159 (Energy and Gravitational Potential Energy)

TQ1. What is the equation for potential energy?

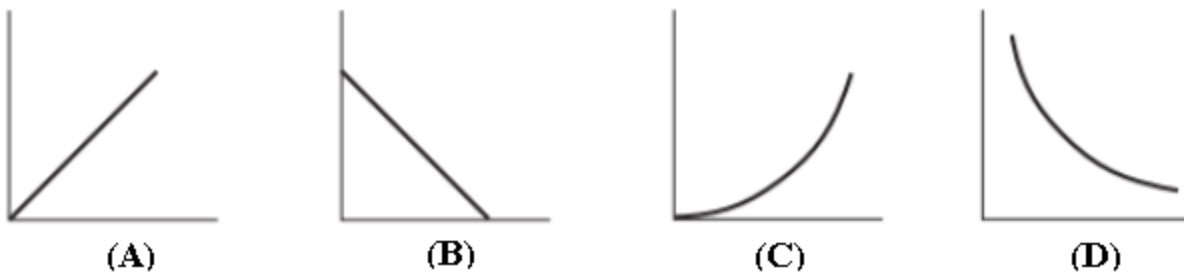
TQ2. What is the equation for gravitational potential energy?

TQ3. If the units of energy are Joules, then what can be said about work and energy?

QQ4. If a 50 kg mass is moving 3 m/s, what is the value of its kinetic energy?

QQ5. If a 30 kg mass is at a height of 5 m above the ground, what is its value of gravitational potential energy?

CQ6. Which graph below best represents the relationship between kinetic energy and speed?



CQ7. Which graph above best represents the relationship between gravitational potential energy and height?

### Read Page 161-162 (Elastic Potential Energy)

TQ8. What is the equation for elastic potential energy?

QQ9. A spring with a spring constant of 5.0 N/m is compressed by a distance of 0.5 m. What is the elastic potential energy of the spring?

### Read Page 164-165 (Work-Energy Theorem)

CQ10. If a car goes from having 0 J to 50 J of kinetic energy, how much work did the engine do to speed it up?

### Read Page 166 (Conservation of Energy)

TQ11. What is the term used for the total sum of all an object's kinetic, gravitational potential energy, elastic potential energy, and thermal energy, etc?

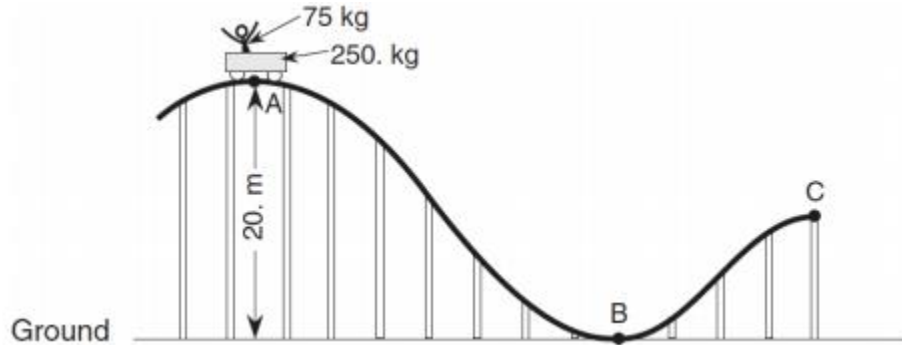
CQ12. A cart on a roller coaster has a total mechanical energy of 150 J at the top of a hill. What will be mechanical energy when the cart is at the bottom of the roller coaster?

QQ13. An 8 kg toy cart is moving at 3 m/s at a height of 0.5 m above the ground. Calculate the total mechanical energy of the toy cart.

TQ14. There is an equation on page 168 for finding the velocity of an object going from full gravitational potential energy to its full kinetic energy. What is that equation?

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QQ15. A 250 kg cart with a 75 kg person is at rest at point A, which is 20 m above the ground. Fill in the chart below calculating all unknown values.

	Point A	Point B	Point C
<b>Height</b>	20 m	0 m	8 m
<b>Gravitational Potential Energy</b>			
<b>Velocity</b>	0 m/s		12 m/s
<b>Kinetic Energy</b>			
<b>Thermal Energy</b>	0 J	0 J	
<b>Total Mechanical Energy</b>			