Work and Energy:

$$\sum\_{}^{}W=∆K$$

OR

$$\sum\_{}^{}W\_{nc}=∆K+∆U$$

1. A 450g block slides up a frictionless inclined plane. The block is initially moving at 2.0m/s and travels 1.4m (parallel to the incline) before coming to rest. Use work energy to find the angle of incline.
2. A 450g block slides up a plane inclined at 36.0o. The coefficient of friction between the block and the surface of the plane is 0.50. The block is initially moving at 6.0m/s. How far (parallel to the incline) will the block slide before coming to rest?
3. A block slides down a frictionless inclined plane. At the bottom of the incline the surface levels. The coefficient of friction between the block and the level surface is 0.442. The block comes to rest 63.2cm from the bottom of the incline. Find the initial height of the block.

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4. A 250kg roller coaster cart crests a 12.0m high hill at 3.00m/s. As the cart down and then back up to the top of the next 8.00m tall hill 2.00x103J of energy is lost as heat. What is the speed of the cart at the top of that hill.
5. A car accelerates up a hill. The 1600kg car is initially at rest and the angle of incline 11.0o. The car travels 0.500km reaching a speed of 80.0km/h. During the process 9650J of heat is produced. Find the work done by the engine.

6. A roller coaster cart has a mass of 175kg. The cart crests the top of a 13.0m high hill at 2.00m/s. The cart then descends to the bottom of a dip, 2.00m high, before rising back up to the crest of a 6.00m high hill. The cart has a speed of 9.14m/s at the crest of the 6.00m high hill. How much energy was lost in the process?

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