1. A 1500 kg car accelerates from rest to 90.0 km/h in 5.00 s. Calculate:

   a) the car's acceleration.

   b) the displacement of the car during the acceleration.

   c) the amount of work done on the car.

   d) the change in kinetic energy of the car.

   e) the power produced by the car.

2. At the instant a man releases a 6.0 kg rock, it is 2.0 m above the ground and traveling at 18.0 m/s. The rock reaches a maximum height of 10.0 m above ground. Determine:

   a) its gravitational potential energy when it leaves his hand.

   b) its kinetic energy when it leaves his hand.

   c) its total mechanical energy when it leaves his hand.

   d) the rock's speed at its maximum height.

   e) the rock's speed just as it strikes the ground.

3. A chair lift takes skiers to the top of a mountain that is 320 m high. The average mass of a skier complete with equipment is 85 kg. The chair lift can deliver three skiers to the top of the mountain every 35 s.

   a) Calculate the gain in gravitational potential energy of the skiers in going to the top of the hill.

   b) Determine the power required to carry out this task.

   c) If friction increases the power required by 25%, what power must the motors running the lift have to deliver?