Name: _____    Date: _____

# Mechanical Advantage Worksheet

**Solve the Following Problems.**

1. The power steering in an automobile has a mechanical advantage of roughly 75. If the input force on the steering wheel is 49 N, what is the output force that turns the car's front wheels?

2. An axe used to split wood is driven into a piece of wood for an input distance of 3.0 cm. If the mechanical advantage of the axe is 0.85, how far apart (output distance) is the wood split?

3. The mechanical advantage of an automobile's wheel and axle is 0.0893. If the wheel's output force is 2220 N, what is the input force that turns the axle?

4. You apply a force of 18 N on to the end of a lever to open a paint can lid. The resistance of the lid is 9 N. Calculate the MA.

5. An Archimedean screw is a screw within a closely fitting cover, so that water can be raised when the screw is turned. Suppose the screw has a mechanical advantage of 12.5. If the screw is turned several times, so that the input distance is 15.7 m, how much has water been lifted upward by the screw?

6.  A mover uses a ramp to load a crate of nails onto a truck.  The crate, which must be lifted 1.4 m from the street to the bed of the truck, is pushed along the length of the ramp.  If the ramp is 4.6 m long and friction between the ramp and crate can be ignored, what is the mechanical advantage of the ramp?

7.   A complex arrangement of pulleys forms what is called the block in a block and tackle.  The rope used to lift the pulleys and the load is the tackle.  A block and tackle is used to lift a truck engine uses a force of nearly 7406 N.  The required force to lift this weight using the block and tackle is 308.6 N.  What is the mechanical advantage of the block and tackle?

8.  It has been proposed that the stones of the Pyramids in Egypt were raised by using ramps.  Suppose one of these ramps had a mechanical advantage of 3.86.  If an input force of 6350 N was provided by laborers, what would the output force on the stone have been?

9.  A wedge with a mechanical advantage of 0.78 is used to raise a house corner from its foundation.  If the resistance force is 7500 N, what is the effort force?