

To find the Mechanical Advantage of ANY simple machine when given the force, use  $MA = R/E$ .

1. An Effort force of 30N is applied to a screwdriver to pry the lid off of a can of paint. The screwdriver applies 90N of force to the lid. What is the MA of the screwdriver?

MA = \_\_\_\_\_

2. A lever is used to lift a heavy rock. The Rock has a mass of 800N. It requires 200N of force to lift the rock using the lever. What is the MA of the lever?

MA = \_\_\_\_\_

3. To open a bottle of soda, a force of 55N is applied to the bottle opener. If the bottle opener applies a force of 675N to the cap, what is the mechanical advantage of the bottle opener?

MA = \_\_\_\_\_

4. A force of 250N is applied to the rope on a pulley system. The box you are lifting with the pulley has a mass of 1250N. What is the MA of the pulley system?

MA = \_\_\_\_\_

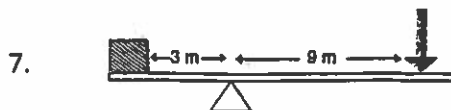
5. \*\*\* A force of 75N is applied to a nutcracker to crack open a walnut. If the MA of the nutcracker is 5, what is the force the nutcracker applies to the walnut?

Force = \_\_\_\_\_

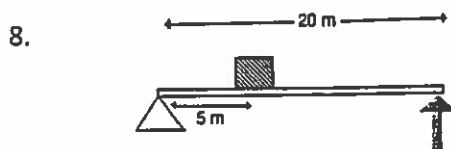
6. \*\*\* A lever is designed to have a mechanical advantage of 6. If the lever applies a force of 1800N to lift a car, how much force is applied to the lever?

Force = \_\_\_\_\_

To find the MA of a Lever WITHOUT the force – Use the formula  $MA = \frac{\text{Distance to the Effort}}{\text{Distance to the Resistance}}$



MA = \_\_\_\_\_



MA = \_\_\_\_\_

9. A lever used to lift a heavy box has an effort arm of 4 meters. It's Resistance arm is .8 meters. What is the MA of the lever?

MA = \_\_\_\_\_

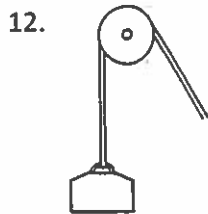
10. What is the mechanical advantage of a lever that has an effort arm of 3 meters and a resistance arm of 2 meters?

MA = \_\_\_\_\_

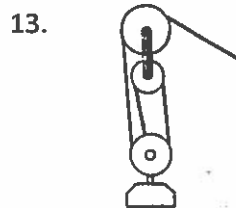
11. A lever with an effort arm of 2 meters has a mechanical advantage of 4. HOW LONG is the resistance arm?

MA = \_\_\_\_\_

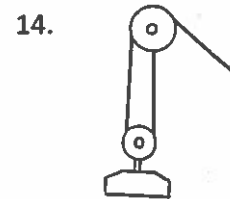
To find the MA of a pulley system – count the number of supporting ropes.



MA = \_\_\_\_\_



MA = \_\_\_\_\_



MA = \_\_\_\_\_

To find the MA of a wheel and Axle – use the formula  $MA = \frac{\text{radius of large wheel}}{\text{Radius of small wheel}}$

15. MA = \_\_\_\_\_

To find the MA of an inclined plane –  $MA = \frac{\text{length of inclined plane}}{\text{Height of inclined plane}}$

16. MA = \_\_\_\_\_

17. A 5 meter ramp lifts objects to a height of .75 meters. What is the MA of the ramp?

MA = \_\_\_\_\_

18. Challenge!!! A mover uses a ramp to pull a 1000-Newton cart up to the floor of his truck (.8meters high). If it takes a force of 200 Newtons to pull the cart, what is the length of the ramp?