Mechanical Advantage Calculations Name:_____

1. What is the ideal mechanical advantage of a 3.5-cm screw of which the threads measure 9.5 cm in length?

2. Calculate the actual mechanical advantage of a pulley attached to a 435-N load, but requiring only 75 N to operate.

3. What is the actual mechanical advantage of a lever created form a plank of wood and a paint can if a 1540-N boulder is lifted with only 225 N of force?

4. Calculate the mechanical advantage of a ramp that is 4 m long and 1.5 m high.

5. A student uses a pencil as a lever to launch a piece of trash into the trashcan. If the student positions a marker as the fulcrum just 3 cm from where she applies effort, and 7 cm from the piece of trash, what is the mechanical advantage the lever gives?

6. A young man works at the local gym. To block the intense afternoon sun, he uses a pulley to lower a 490-N screen over the windows. If he uses only 65 N of force to operate the pulley, what is the mechanical advantage of the pulley?

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Mechanical Advantage Calculations Name:___ANSWER KEY_____

1. What is the ideal mechanical advantage of a 3.5-cm screw of which the threads measure 9.5 cm in length?

$$IMA = \frac{d_E}{d_R} = \frac{9.5cm}{3.5cm} = 2.7$$

2. Calculate the actual mechanical advantage of a pulley attached to a 435-N load, but requiring only 75 N to operate.

$$AMA = \frac{F_R}{F_E} = \frac{435N}{75N} = 5.8$$

3. What is the actual mechanical advantage of a lever created form a plank of wood and a paint can if a 1540-N boulder is lifted with only 225 N of force?

$$AMA = \frac{F_R}{F_E} = \frac{1540N}{225N} = 6.84$$

4. Calculate the mechanical advantage of a ramp that is 4.0 m long and 1.5 m high.

$$IMA = \frac{d_E}{d_R} = \frac{4.0cm}{1.5cm} = 2.7$$

5. A student uses a pencil as a lever to launch a piece of trash into the trashcan. If the student positions a marker as the fulcrum just 3 cm from where she applies effort, and 7 cm from the piece of trash, what is the mechanical advantage the lever gives?

$$IMA = \frac{d_E}{d_R} = \frac{3cm}{7cm} = 0.4$$

6. A young man works at the local gym. To block the intense afternoon sun, he uses a pulley to lower a 490-N screen over the windows. If he uses only 65 N of force to operate the pulley, what is the mechanical advantage of the pulley?

$$AMA = \frac{F_R}{F_E} = \frac{490N}{65N} = 7.5$$