

13.1 Concept Review - Section: Work, Power, and Machines

1. **Define** each of the following terms **and** write the equation for each.

a. work

b. power

c. mechanical advantage

2. **Explain** the relationship between work and power.

3. **Explain** how machines make work easier if they still require that the same amount of work be done

4. **Calculate** the amount of work done when a grocery store stocker uses 120 N of force to lift a sack of flour 1.5 m onto a shelf.

Givens:	Equation:	Show your work:	Answer with unit:

5. **Calculate** the average power in kilowatts required to pull a car up a ramp if the amount of work is 250 kJ over a period of 45 s. (no conversion is needed!)

Givens:	Equation:	Show your work:	Answer with unit:

6. **Calculate** the mechanical advantage of a group of pulleys used to raise an engine from a car. The engine is raised 1.2 m with the pulleys when 4.8 m of rope is pulled through the pulleys.

Givens:	Equation:	Show your work:	Answer with unit:

MORE ON BACK!

Name _____ Class _____ Date _____

Match each of the words below with the correct unit(s). **Some have more than one answer!**

- | | |
|------------------------|-------------------|
| _____ 7. Distance | a. m/s |
| _____ 8. Work | b. kg |
| _____ 9 Force | c. meter |
| _____ 10. Power | d. kilometer |
| _____ 11. Time | e. km/hr up |
| _____ 12. Mass | f. joules |
| _____ 13. Velocity | g. Newtons |
| _____ 14. Speed | h. gram |
| _____ 15. Acceleration | i. seconds |
| | j. watts |
| | k. m/s^2 |
| | l. mph |
| | m. hours |

16. Calculate the mechanical advantage of a ramp that is 5 meters high and 15 meters long.

Givens:	Equation:	Show your work:	Answer:

17. Work is done when a _____ is applied that _____ an object in the direction of the applied force.

18. Power is the _____ at which _____ is done.

19. _____ is a number that tells you how much easier it is to use a machine than to perform the same work without a machine. This number **SHOULD** be greater than _____. It does not have a unit.

20. The work that **YOU** do is called the _____. The _____ is the amount of force applied to the object or the distance it moved.

21. A _____ is something that decreases the force necessary by increasing the distance or direction of the force. Ex: ramp, pulley