

13.1 Worksheet – Extra Practice  
Work & Power problems

Name \_\_\_\_\_

YOU MUST SHOW ALL WORK WITH PROPER UNITS FOR FULL CREDIT!

1. A force of 10,000 N is applied to a stationary wall. How much **work** is performed?
2. A bulldozer performs 80,000 J of work pushing dirt a distance of 16 m. What is the **force** of the dirt?
3. An ant does 1 J of work dragging a 0.0020 N grain of sugar. What **distance** does the ant drag the sugar?
4. You are walking from your math class to your science class. You are carrying books that weigh 20 N. You walk 45 m down the hall, climb 15 m up the stairs, and then walk another 30 m to your science class. What is the total **work** performed on your books?
5. A horse performs 15,000 J of work pulling a wagon for 20 seconds. What is the horse's **power**?
6. A 750 N pole vaulter lifts himself 5.0 m high in 2.5 seconds. What is his **power**?
7. A pump drains a small pond by performing 120,000 J of work. The power rating of the pump is 1000 W. How much **time** does it take to drain the pond?

8. A tow truck pulls a car out of a ditch in 6.5 seconds. If 6000 W of power is used, how much **work** is performed by the truck?
9. An elevator lifts five passengers 30 m in 24 seconds. The power is 15,000 W. What is the total **weight** of the elevator and passengers?
10. How much **work** is done by a crane that lowers 1000 N of material a distance of 150 meters?
11. How much **work** is done when a 1 kg mass is raised a vertical distance of 1 meter?
12. A 5 kg rock is lifted 2 meters in 5 seconds
- How much **work** is done?
  - What **power** is used?
13. A weight lifter lifts a 150 kg barbell above his head from the floor to a height of 2 meters. He holds the barbell there for 5 seconds. How much **work** does he do during that 5 second interval?

14. A student who weighs 500 N climbed the stairs from the first floor to the third floor, 15 meters above, in 20 seconds.

a) How much **work** did she do?

b) What was her **power**?

15. If 4000 J are used to raise a 30 kg mass, what **distance** is the mass raised?

16. A force used to lift a 12 kg mass to a height of 8 meters in 2 seconds does 1040 J of work.

a) How much **force** is used?

b) What **power** is developed?

17. A book that weighs 6 N sits on a table. There is a shelf 1.5 m above the table. a) How much **work** would it take to put the book on the shelf?

b) What kind of energy does the book have while it is moving up?

c) What kind of energy does the book have once it is up on the shelf?

d) Which has more stored up energy, the book on the shelf or the book on the table? \_\_\_\_\_ WHY?

- e) Where did the energy come from for the book with more stored-up energy?
  
- f) How much more energy does this book have than the other book?
  
- g) How can the book that has more stored-up energy use this energy to do work?