

Worksheet - Work & Power Problems

I. Work

A. Sample Problems:

1. $F = 200$ Newtons Formula: _____
 $d = 50$ meters Substitution: _____
 $W = ?$ Answer with unit of measure: _____

2. $F = 5$ Newtons Formula: _____
 $W = 75$ Joules Substitution: _____
 $D = ?$ Answer with unit of measure: _____

3. $W = 125$ Joules Formula: _____
 $d = 10$ meters Substitution: _____
 $F = ?$ Answer with unit of measure: _____

4. If 150 Joules of work is needed to move a box 10 meters, what force was used?

B. Fill-in-the-blank:

1. _____ is done when an object moves through a distance because of a _____ acting upon the object.
2. When calculating work, you should use the formula: work = force X _____.
3. The SI unit for work is the _____. It is represented by the letter _____.

C. Work Problems:

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| 4. $F = 90$ N _____ $d = 5$ m _____ $W = ?$ _____ | 5. $F = 6$ N _____ $W = 72$ J _____ $d = ?$ _____ | 6. $W = 120$ J _____ $d = 24$ m _____ $F = ?$ _____ |
| 7. $W = ?$ _____ $F = 62.6$ N _____ $d = 13$ m _____ | 8. $W = 13.2$ J _____ $F = 2$ N _____ $d = ?$ _____ | 9. $W = 136$ J _____ $d = 27.2$ m _____ $F = ?$ _____ |

10. If 360 Joules of work are needed to move a crate a distance of 4 meters, what is the weight of the crate?

11. If a group of workers can apply a force of 1000 Newtons to move a crate 20 meters, what amount of work will they have accomplished?

12. If 68 Joules of work were necessary to move a 4 Newton crate, how far was the crate moved?

13. How much work is done in holding a 15 N sack of potatoes while waiting in line at the grocery store for 3 minutes.

II. Power

A. Sample Problems:

- $W = 500$ Joules
 $t = 25$ seconds
 $P = ?$
Formula: _____
Substitution: _____
Answer with unit of measure: _____
- $P = 25$ watts
 $W = 5000$ Joules
 $t = ?$
Formula: _____
Substitution: _____
Answer with unit of measure: _____
- $P = 170$ watts
 $t = 20$ seconds
 $W = ?$
Formula: _____
Substitution: _____
Answer with unit of measure: _____
- If a man moves a large box that weighs 10 Newtons 20 meters in 30 seconds, how much power was used?

B. Fill-in-the-blank:

- _____ is the rate at which work is done.
- When calculating power, you should use the formula $P =$ _____ divided by _____. In this formula, "P" stands for power, _____ stands for work, and _____ for time.
- The SI unit for Power is the _____.

C. Power Problems

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|---|-------|---|-------|--|-------|
| 4. $W = 100$ J $t = 10$ s $P = ?$ | _____ | 5. $W = 225$ J $P = 25$ W $t = ?$ | _____ | 6. $P = 20$ W $t = 15$ s $W = ?$ | _____ |
| 7. $W = 500$ J $t = 25$ s $P = ?$ | _____ | 8. $W = 336$ J $t = ?$ $P = 14$ W | _____ | 9. $W = ?$ $t = 16.6$ s $P = 64$ W | _____ |
- A person weighing 600 N gets on an elevator. The elevator lifts the person 6 m in 10 seconds. How much power was used?
 - How much time is needed to produce 720 Joules of work if 90 watts of power is used?
 - If 68 W of power is produced in 18 seconds, how much work is done?
 - A set of pulleys lifts an 800 N crate 4 meters in 7 seconds. What power was used?