

# Discussion Section: Week 8

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## I Responses

1. True.
2. False, the standard metric unit of work is Joule(s).
3. Units of works are equivalent to a Newton times a meter ( $N \cdot m$ ) since work is also represent via the equation of:  $W = \vec{F} \cdot \vec{r}$ . Since  $\vec{F}$  is measured in Newtons and  $\vec{r}$  is measured in meters.
4.  $(kg \cdot m^2)/s^2$  is not a a unit of work; the only units of work are  $N \cdot m$  (Newton(s)-meter) and Joules ( $J$ )
5. Work is not time-dependent; as in its equation mentioned in the previous response only include a  $\vec{r}$  that measures in meters which could either be displacement or meters. And  $\vec{F}$  is measured in Newtons to measure Force; therefore, work itself is not time-dependent as it does not have a time-component within the equation.
6. This is false since there is active displacement cause be either two forces of that from the truck and Superman.
7. This statement is false as assuming that the displacement is horizontal given that the upward force vector from carrying the bucket; this means that there is no displacement since the vector force is perpendicular to the displacement; therefore, this statement is false.
8. Work is being done here, since we have a force being applied to a chain of the roller coaster as it goes up the hill of some  $x$  distance, and with an assumption of some angle  $\theta$ .
- 9.

10.

11.

12.

13. This statement is false as the net force can be equal to zero if there's constant speed [which is declared in this problem]; but individual forces within the net force can do either positive and/or negative work.

14. This statement is true; this pretty much explains itself. We have an object moving to the right with a leftward force being applied on this object; therefore proving true to a certain extent the general equation of work:  $W = F \cdot d \cdot \cos(\theta)$

15.