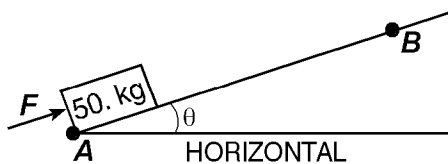


Directions: Use the Work and Power equations to answer the following questions. **SHOW ALL WORK FOR THE FREE RESPONSE QUESTIONS IN THE SPACE PROVIDED**

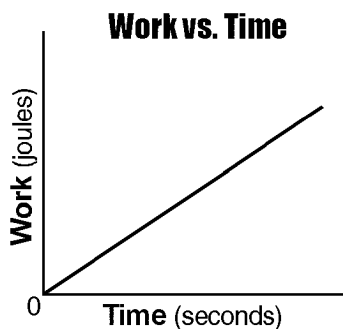
- [illegible]

- 8) The diagram below shows a 50.-kilogram crate on a frictionless plane at angle θ to the horizontal. The crate is pushed at constant speed up the incline from point A to point B by force F .



If angle θ were increased, what would be the effect on the magnitude of force F and the total work W done on the crate as it is moved from A to B?

- A) W would remain the same and the magnitude of F would decrease.
 B) W would increase and the magnitude of F would decrease.
 C) W would increase and the magnitude of F would increase.
 D) W would remain the same and the magnitude of F would increase.
- 9) The graph below represents the relationship between the work done by a student running up a flight of stairs and the time of ascent.



The slope of the given graph would have units of

- A) watts B) newtons C) seconds D) joules
- 10) Two weightlifters, one 1.5 meters tall and one 2.0 meters tall, raise identical 50.-kilogram masses above their heads. Compared to the work done by the weightlifter who is 1.5 meters tall, the work done by the weightlifter who is 2.0 meters tall is
- A) the same B) greater C) less
- 11) A 680-newton student runs up a flight of stairs 3.5 meters high in 11.4 seconds. The student takes 8.5 seconds to run up the same flight of stairs during a second trial.
- (a) Determine the work done by the 680-newton student in climbing the stairs. *[Show all calculations, including the equation and substitution with units.]*
- (b) Determine the power developed by the student during the 11.4-second climb. *[Show all calculations, including the equation and substitution with units.]*
- (c) Using one or more complete sentences, compare the power developed by the student climbing the stairs in 11.4 seconds to the power developed during the 8.5-second trial.

