

Energy and Work Practice Problems Answers

1. The work would be tripled if the distance was tripled. The potential energy that the barbell has would be the same as the amount of work that was done.
2. The 10 kg load would require a work = 196 Joules and the 5 kg load would require the same 196 Joules of work.
3. The work required would still be 196 J since the force is being pushed up.
4. 100 J
5. 70.7 J (There is less work done since the force being done is at an angle. Therefore only the horizontal component of the force is doing work. The horizontal component is simply 7.07 J)
6. It has 100 J of potential energy since the work done would be the amount that the potential energy changed.
 - a. It would have doubled the potential energy.
7. KE = 200 J
 - a. $v = 11.54 \text{ m/s}$
 - b. $h = 6.8027 \text{ m}$
8. KE of the bike = 2880 J KE of the truck = 2000 J KE of the car = 40,000 J
9. b. PE of i = 147 J PE of ii = 196 J PE of iii = 147 J PE of iv = 0 J
 - c. KE of i = 0 J KE of ii = 0 J KE of iii = 6 J KE of iv = 8 J
 - d. This question should have read what is the total energy of each ball
TE of i = 147 J TE of ii = 196 J TE of iii = 153 J TE of iv = 8 J
10. b. KE of i = 8 J KE of ii = 9 J KE of iii = 6 J KE of iv = 2 J
 - c. h of i = .8 m h of ii = .45 m h of iii = .2 m h of iv = .05 m
 - d. PE of i = 8 J PE of ii = 9 J PE of iii = 6 J PE of iv = 2 J
 - e. height was independent of the mass where as the PE was dependent on the mass
11. 80 m (Since speed doubles, the amount of KE is quadrupled. Therefore the work needed to bring it to a stop would have to be quadrupled. The brakes will apply the same amount of force. Therefore the braking distance would quadruple.)