

43. You do work on something when you lift it against gravity. How does this work relate to gravitational potential energy? If the lifted object is released, what becomes of this energy? Be sure to define all terms that you use.
44. Discuss how energy conservation applies to a pendulum. Where is potential energy the most? The least? Where is kinetic energy the most? The least? Where is it moving the fastest? Stopped?
45. What is the work done in lifting 60 kg of blocks to a height of 20 m?
46. A toy cart moves with a kinetic energy of 10 J. If its speed is doubled, what will its kinetic energy be?
47. In raising a 3000-N piano with a pulley system, it is noted that for every 2 m of rope pulled down, the piano rises 0.2 m. Ideally, what force is needed to lift the piano?

48. A car traveling at 50 km/h will skid 20 m when its brakes are locked. If the same car is traveling at 150 km/h, what will be its skidding distance?

49. A 30-kg girl runs up the staircase to a floor 5 m higher in 8 seconds. What is her power output?

50. At what height does a 1000-kg mass have a potential energy of 1 J relative to the ground?

51. The 4.0-kg head of an ax is moving at 4.0 m/s when it strikes a log and penetrates 0.01 m into the log. What is the average force the blade exerts on the log?

52. An anvil hanging vertically from a long rope in a barn is pulled to the side and raised like a pendulum 1.60 m above its equilibrium position. It then swings to its lowermost point where the rope is cut by a sharp blade. The anvil then has a horizontal velocity with which it sails across the barn and hits the floor, 10.0 m below. How far horizontally along the floor will the anvil land?