

Assignment Work, Power and Universal Gravitation

Due April 22, 2020

Total: /20

Name:

1. Two planets (A and B) are have a force of gravitational attraction between them equalling 5.6×10^{18} N. If planet A has a mass of 3.0×10^{22} kg and planet B has a mass of 5.6×10^{23} kg what is the distance that separates their centres? [4 marks]

2. Riley pushes Mitchell with a force of 200 N at an angle of 20° .
 - a. If Mitchell moves a distance of 30 m how much work did Riley do on Mitchell?
 - b. If the force of friction between Mitchell's shoes and the floor is 20 N, what negative work does the friction do on Mitchell?
 - c. What is the overall work done on Mitchell? [6 marks]

3. Riley decides to now push Nathan with a force of 300 N at an angle of 30° on a frictionless surface, for 45 m. If Riley can generate 98 W of power to do this action how long will it take him to push Nathan the 45 m? [3 marks]

4. Tayla is really great runner. She can maintain a speed of 10 m/s easily.
 - a. Determine Tayla's kinetic energy if her mass is 62 kg.
 - b. Determine Tayla's power if she goes for a 30 minute run. [4 marks]

5. Eric standing on the roof of St. Mary's High School. If he has a gravitational potential energy of 7600 J in this position how tall is the school? Note Eric is 71 kg. [3 marks]