Work and Power Questions from A6.1

0.856, 380. J 45.0 W, 2700 J 9.32 m 282 s	1. a. A heater consumes 125 J of fuel and produces 107 J of useful heat. What is its efficiency? How much fuel would it consume to produce 325 J of useful heat? b. A motor does 585 J of work in 13.0 seconds. What is its power output? What work could it do in 60.0 seconds? c. You do 412 J of work dragging a 26.5 kg box over a level floor (at a constant low speed) where the coefficient of dynamic friction is 0.170. What distance did you drag it? d. What is the minimum time a 540. W motor can lift a 3450 kg land rover 4.50 m?
567 J, 408 J 80.4 W, 19.0 s 3.20 m 406 W	2. a. A heater is 91.0% efficient. How much useful heat would it produce from 623 J of fuel energy? How much fuel would it consume to produce 371 J of useful heat? b. A motor does 965 J of work in 12.0 seconds. What is its power output? In what time could it do 1530 J of work? c. You do 371 J of work lifting a 11.8 kg box. What height did you lift it? d. What is your power output if you drag a 87.0 kg sled a level distance of 43.0 m in 19.0 s where the coefficient of dynamic friction is 0.210?
0.916, 591 J 5040 J, 1.80 s 9.96 kg 43.8 s	3. a. A heater consumes 215 J of fuel and produces 197 J of useful heat. What is its efficiency? How much useful heat would it produce from 645 J of fuel energy? b. What work does a 420. W motor do in 12.0 seconds? What time would it take the motor to do 758 J of work? c. You do 850. J of work raising what mass a vertical distance of 8.70 m? d. A sled dog has a power output of 310. W. In what time can it drag a 112 kg sled 95.0 m across a frozen lake where the coefficient of friction is 0.130?
204 J, 584 J 51.6 W, 6970 J 15.0 kg 674 W	4. a. A heater is 82.0% efficient. How much fuel would it consume to produce 167 J of useful heat? How much useful heat would it produce from 712 J of fuel energy? b. A motor does 568 J of work in 11.0 seconds. What is its power output? What work could it do in 135. seconds? c. You do 381 J of work dragging a box 23.5 m over a level floor (at a constant low speed) where the coefficient of dynamic friction is 0.110. What is the mass of the box? d. What is the minimum power rating a motor can have if it needs to lift a 2350 kg SUV a vertical distance of 4.50 m in 154 s?
0.945, 912 J 1890 J, 7.00 s 0.137 135 s	5. a. A heater consumes 618 J of fuel and produces 584 J of useful heat. What is its efficiency? How much fuel would it consume to produce 862. J of useful heat? b. What work does a 118 W motor do in 16.0 seconds? What time would it take the motor to do 826 J of work? c. You do 645 J of work dragging a 15.0 kg box over a level floor (at a constant low speed) a distance of 32.0 m. What was the dynamic coefficient of friction? d. What is the minimum time a 746. W motor can lift a 2770 kg land rover 3.70 m?