## Work, energy, power, efficiency

1. An electric motor in a crane is used to lift a 1.4 kg weight.
a. What force is needed to lift the weight at a constant speed? Take $\mathrm{g}=9.8 \mathrm{~N} / \mathrm{kg}$.
b. The weight is lifted 2.6 m upwards. Calculate how much work is done.
c. It takes 34 seconds to lift the weight. Calculate the useful power output of the crane
d. While lifting the weight the motor consumes 5.0 W of power. Calculate the energy input to the motor in 34 seconds.
e. The energy supplied to the motor is greater than the work done lifting the weight. Explain what has happened to the remaining energy.
f. Calculate the efficiency of the crane.
