

## 1.E: The Basics (Exercises)

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### Q1.1

Convert the temperatures indicated to complete the following table

°F	°C	K
	25	
98.6		
		373.15
	-40	
32		

### Q1.2

Make a graph representing the potential energy of a harmonic oscillator as a function of displacement from equilibrium. On the same graph, include a function describing the kinetic energy as a function of displacement from equilibrium as well as the total energy of the system.

### Q1.3

Calculate the work required to move a 3.2 kg mass 10.0 m against a resistive force of 9.80 N.

### Q1.4

Calculate the work needed for a 22.4 L sample of gas to expand to 44.8 L against a constant external pressure of 0.500 atm.

### Q1.5

If the internal and external pressure of an expanding gas are equal at all points along the entire expansion pathway, the expansion is called “reversible.” Calculate the work of a reversible expansion for 1.00 mol of an ideal gas expanding from 22.4 L at 273 K to a final volume of 44.8 L.

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