

1.E: The Basics (Exercises)

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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