2. A particle accelerator generates neutrons at 2500K and whose speed is given by $\sqrt{(3k_BT/m)}$. Determine the de Broglie wavelength of the neutron.

3. The threshold wavelength of light required to eject electrons from the surface of the metal Lanthanum (Z = 57) is 3760 Å.
   (a) What is the work function of the metal in electron-volts and wavenumbers?
   (b) What is the maximum kinetic energy of photoelectrons emitted by this metal when it is illuminated with ultraviolet light of wavelength 2000 Å?
   (c) The work function for barium is 2.48 eV. If light of 400 nm is shined on a barium cathode, what is the maximum velocity of the ejected electrons?

4. The clean surface of Na is illuminated with monochromatic radiation of various wavelengths (λ) and the retarding (or stopping) potentials (V_s) required to stop the most energetic photoelectrons are observed as follows.

λ / Å	2536	2830	3039	3302	3663	4358
V_s / V	2.60	2.11	1.81	1.47	1.10	0.57

Plot these data in such a way as to show that they lie along a straight line as predicted by the photoelectric equation, and obtain a numerical value for Planck's constant *h*. Note: at the stopping potential the kinetic energy of the electrons is balanced exactly by the potential energy due to the stopping potential, i.e. KE = eV_s, where e is the charge on an electron.