1. A photoelectric experiment is shown to the right.
   
a) What happens to the number of photoelectrons when you increase the intensity of the light? [1 pt]
   
b) What effect does this have on the current? [1 pt]
   
c) A photoelectron with kinetic energy $K$ is moving to the left as shown in the figure above. Indicate the sign of the battery at points A and B that will create a field to slow the electron down. [1 pt]
   
d) What is the stopping voltage in terms of the kinetic energy and charge of the electron? Will the stopping voltage change if we change the intensity of incoming light? [2 pts]
2. A stopping potential of 3V is needed when a frequency of $1.61 \times 10^{15}$ Hz is shone on a metal.

\[ K = hf - W, \text{ where } h = 4.14 \times 10^{-15} \text{ eV} \cdot \text{s} \]

a) What is the energy transferred by each photon? (in eV) \([\text{1 pt}]\)

b) What is the maximum kinetic energy of the ejected electrons? \([\text{1 pt}]\)

c) Calculate the work function of the metal. \([\text{2 pts}]\)
3. The relations between frequency and stopping voltage are shown on the right.

a) Express the stopping voltage, $V_s$, in terms of $h$, $e$, $f$, and W (work function). [1 pt]

b) Let $f$ be the variable. Compare (a) to $y = mx + b$. What are the units of $m$ and $b$? [2 pts]

c) What is the relation between the slope and Planck's constant, $h$? Use the slope to calculate Planck's constant (in $eV \cdot s$) [1 pt]
d) What is the y-intercept? [1 pt]

e) Calculate the work function by using your answer in part (d). [1 pt]