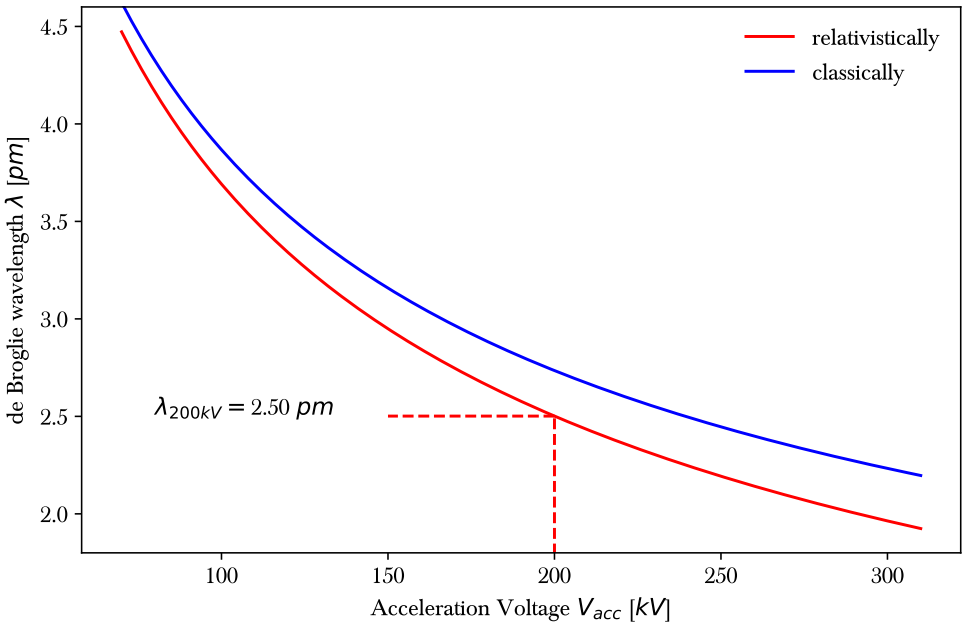


Exercise 1

a)

The wavelengths λ are plotted in both the classical and relativistic case.

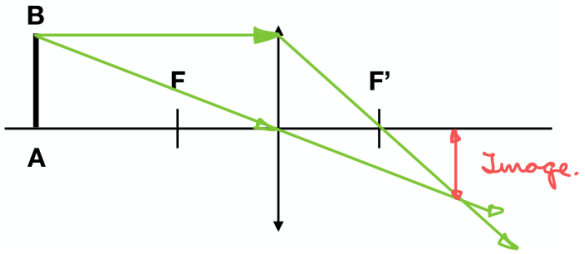
b)

The relativistic de Broglie wavelength for an electron at an energy of 200 keV is $\lambda_{200keV} = 2.05\ pm$.

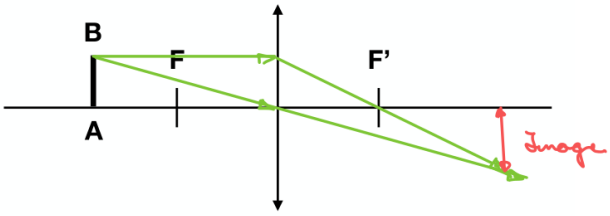
Exercise 2

For the largest magnification you want the objective to be as close to the focal point as possible.

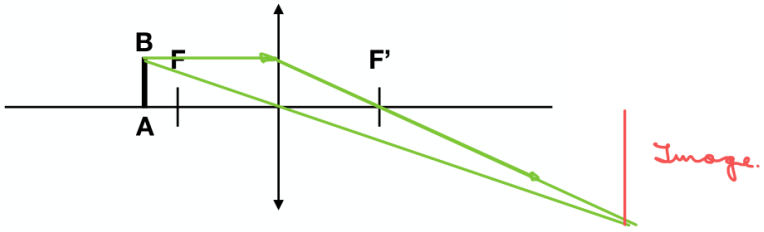
(a)



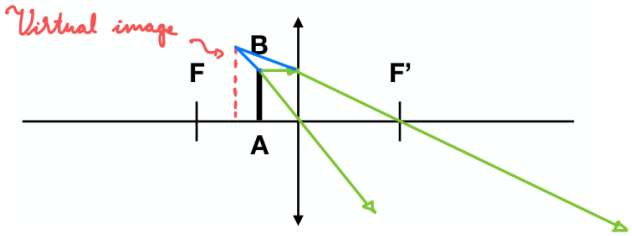
(b)



(c)



Exercise 3



For this setup we do not get a image after the lens but only a virtual image before the lens.