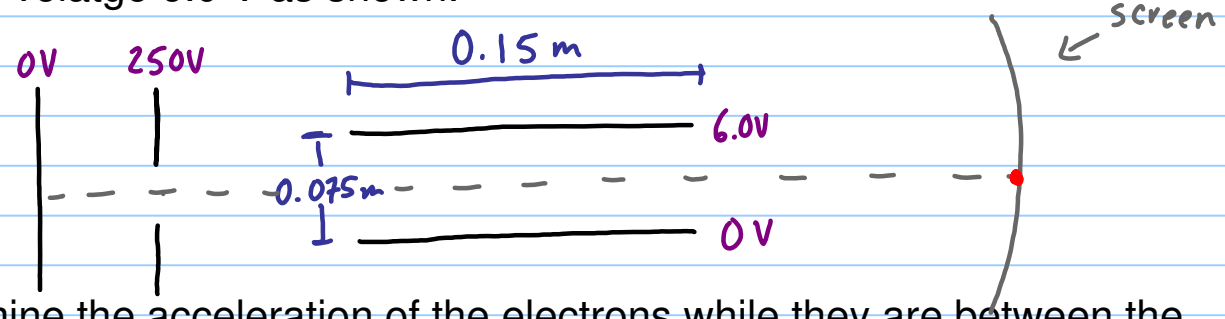
Quiz 7b

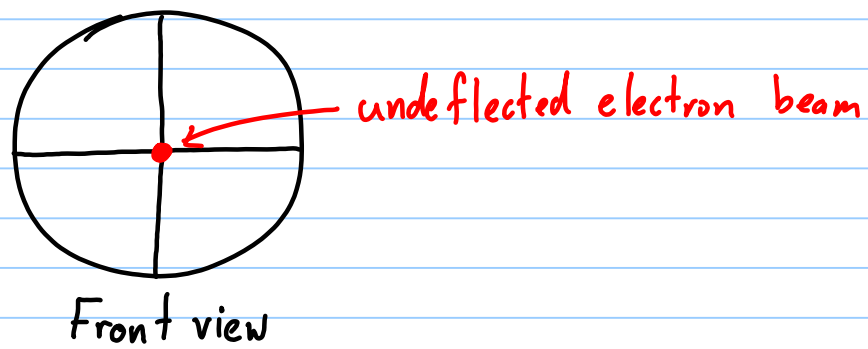
Note Title 23/02/2012

A cathode ray tube operates with an accelerating voltage of 250 V and a deflecting volatge 6.0 V as shown.



a) Determine the acceleration of the electrons while they are between the deflecting plates when the voltage is applied.

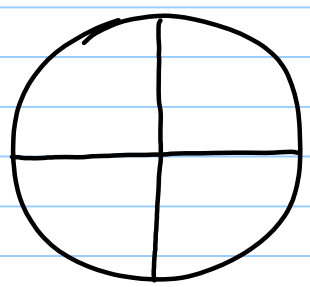
b) Before the deflecting voltage is applied, the electrons follow the dotted path shown and strike the center of the screen. On the diagram below showing the ***front of the screen***, show where the electrons strike the screen when the defelcting voltage is applied.

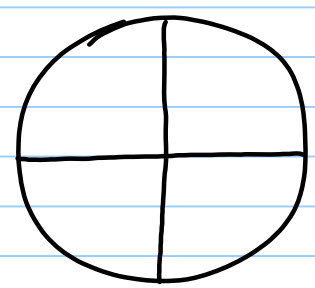


c) On the diagram below show the new location of the electron beam if:

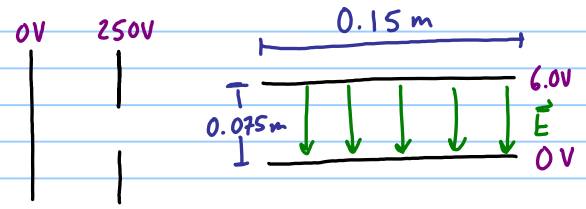
i) The deflecting voltage is increased to 12.0 V

ii) The accelerating voltage is increased to 500 V





a.)



$$\vec{E} = \frac{\Delta V}{d} = \frac{6.0V}{0.075m} = 80\ N/C$$

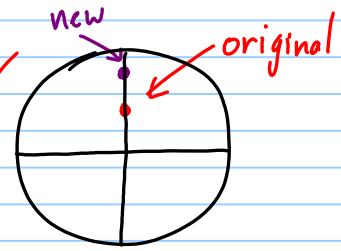
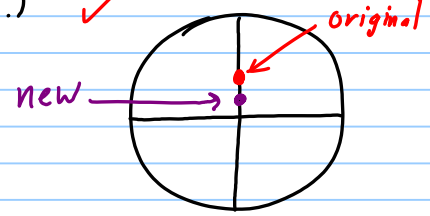
$$F_E = \vec{E}q = (80\ N/C)(1.6\times10^{-19}C) = 1.28\times10^{-17}N$$

$$F_E = ma \qquad a = \frac{F_E}{m} = \frac{1.28\times10^{-17}N}{9.11\times10^{-31}kg}$$

$$= \boxed{1.4\times10^{13}\ m/s^2}$$

b.)

c.) i)



ii.)