1. The diagram to the right represents (at a particular instant of time), the electric \( E \) and magnetic \( B \) field vectors in a linearly polarized plane wave which is travelling perpendicularly to the plane of the paper. The amplitude of the electric field is \( E_0 = 30 \text{ V/m} \).

(a) Is the wave travelling into or out of the plane of the paper? (1 point)

(b) What is the amplitude of the magnetic field? (1 point)

(c) The wave is made to pass through a polarizer whose transmission axis for the electric field makes an angle of \( \theta = 60^\circ \) with the vertical. (In other words, \( 60^\circ \) with respect to the electric field in the wave.) What is the intensity of the wave in terms of its intensity \( I_0 \) before it went through the polarizer? (2 points)
2. The figure below shows an $h = 1$ cm tall object (the arrow) which is $d_0 = 6$ cm to the left of a spherical convex mirror whose radius of curvature is $R = 12$ cm and whose focal distance is $f = -6$ cm. The focal point, $F$, and the center of curvature $C$ are indicated on the diagram.

(a) On the diagram above, carefully and neatly trace at least two rays from the tip of the arrow to show where the image of the tip of the arrow is located. Draw the image of the arrow. You may use your answers to the parts below to guide your drawing or, if you’ve done the drawing carefully enough, you may use measurements from the drawing to check your answers below. (2 points)

(b) Where (meaning how far from the mirror and to the left or right?) is the image located? How tall is it? (2 points)

(c) Is the image real or virtual? Is the image erect or inverted? (2 points)