94. Our coordinate system has $\hat{\imath}$ pointed east and $\hat{\jmath}$ pointed north. All distances are in kilometers, times in hours, and speeds in km/h. The first displacement is $\vec{r}_{AB} = 483\,\hat{\imath}$ and the second is $\vec{r}_{BC} = -966\,\hat{\jmath}$.

(a) The net displacement is

$$\vec{r}_{AC} = \vec{r}_{AB} + \vec{r}_{BC} = 483\,\hat{\imath} - 966\,\hat{\jmath} \longrightarrow (1080 \angle -63.4^\circ)$$

where we have expressed the result in magnitude-angle notation in the last step. We observe that the angle can be alternatively expressed as 63.4° south of east, or 26.6° east of south.

(b) Dividing the magnitude of $\vec{r}_{AC}$ by the total time (2.25 h) gives the magnitude of $\vec{v}_{\text{avg}}$ and its direction is the same as in part (a). Thus, $\vec{v}_{\text{avg}} = (480 \angle -63.4^\circ)$ in magnitude-angle notation (with km/h understood).

(c) Assuming the AB trip was a straight one, and similarly for the BC trip, then $|\vec{r}_{AB}|$ is the distance traveled during the AB trip, and $|\vec{r}_{BC}|$ is the distance traveled during the BC trip. Since the average speed is the total distance divided by the total time, it equals

$$\frac{483 + 966}{2.25} = 644 \text{ km/h} .$$