

58. We denote the police and the motorist with subscripts p and m , respectively. The coordinate system is indicated in Fig. 4-38.

(a) The velocity of the motorist with respect to the police car is

$$\vec{v}_{mp} = \vec{v}_m - \vec{v}_p = -60\hat{j} - (-80\hat{i}) = 80\hat{i} - 60\hat{j} \text{ (km/h)} .$$

(b) \vec{v}_{mp} does happen to be along the line of sight. Referring to Fig. 4-38, we find the vector pointing from car to another is $\vec{r} = 800\hat{i} - 600\hat{j}$ m (from M to P). Since the ratio of components in \vec{r} is the same as in \vec{v}_{mp} , they must point the same direction.

(c) No, they remain unchanged.