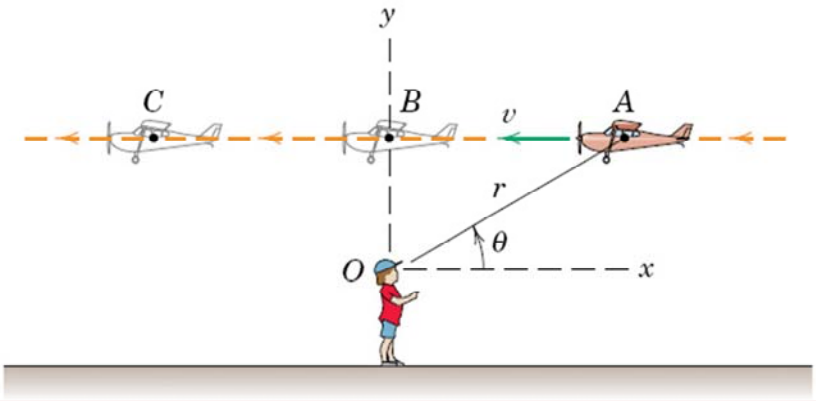
Question of the Day

A model airplane flies over an observer O with constant speed. Determine the signs (+, -, or 0) for $r, \dot{r}, \ddot{r}, \theta, \dot{\theta}$, and $\ddot{\theta}$ at each position A, B, and C.



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Position	r	$\dot{r}$	$\ddot{r}$	θ	$\dot{\theta}$	$\ddot{\theta}$
A	+	−	+	+	+	+
B	+	0	+	+	+	0
C	+	+	+	+	+	−

Notes: (1) $r \geq 0$, always, by definition

(2) $\dot{r}$ determined by inspection

(3) $\ddot{r}$ found from $a_r = \ddot{r} - r\dot{\theta}^2 = 0$

(4) $\theta \geq 0$, by definition in figure

(5) $\dot{\theta} > 0$ here, by inspection

(6) $\ddot{\theta}$ found from $a_\theta = r\ddot{\theta} + 2\dot{r}\dot{\theta} = 0$