

6. (12 points) A team of biologists is interested in the ability of certain birds to migrate great distances with little rest. The biologists are monitoring a flock of birds known to migrate after spending the winter in the warm climes of the Okefenokee swamp. The location of the flock, in $x(t)$ hundreds of miles north, and $y(t)$ hundreds of miles east of the base camp of the biologists, t days after their departure from the Okefenokee swamp is given by

$$x(t) = 3t + \frac{1}{2},$$
$$y(t) = t^{\frac{3}{2}} + \frac{1}{5}.$$

(a) Where is the Okefenokee swamp in relation to the base camp of the biologists?

(b) Is there ever a time when the flock of birds is travelling due North-East? If so, when? If not, explain why not.

(c) Is the flock of birds constantly moving throughout the first three days of their journey? Why or why not?

(d) How far does the flock of birds travel in the first three days of their journey?