

10. Suppose a ship is searching visually for a life raft and that at time t , range is $r(t)$ and detection rate is

$$\gamma(t) = \frac{40}{r(t)^3} \text{ hr}^{-1},$$

with t in hours, and $r(t)$ in nm. The ship starts the search at an initial range of 2 nm and approaches the life raft on a direct course at a speed of 10 knots. Answer the following:

- What are $r(t)$ and $\gamma(t)$?
- What is the probability that detection will occur before the range decreases to 1 nm?

11. In a continuous-looking problem the maximum range of detection is 200 nm and the target will



