Problem statement A spaceship maneuvering in space, far from any gravitational influences, is executing a predetermined acceleration program which yields a position vector $\mathbf{r}(t)$ for the ship, relative to a small space beacon, given by

$$\mathbf{r}(t) = (t-2)\mathbf{i} + (t-3)^2\mathbf{j} + (t-4)^3\mathbf{k}.$$

a) Suppose that the captain shuts down the engines at time t_0. Find the subsequent motion of the ship.

b) Show that if t_0 is chosen appropriately then the ship will hit the beacon.