Background Information

Without worrying about the derivation, for now accept that electromagnetic waves (i.e., light) have a well-defined momentum that is not associated with mass. Rather, the magnitude of momentum, $p$, carried by light is related to its energy, $E$, by the equation $E = pc$.

Problem Statement

An 80 kg astronaut has been doing repair work outside her space capsule for 15 minutes when she discovers that her tether is no longer connected and she is loose in space 4.0 m from the capsule. Mounted firmly to her suit is a laser capable of outputing 1000 W for exactly 1 hour, at which point it ceases to function entirely. Assuming her suit was filled with enough air to last 8 hours when she left the capsule, can she use the laser to get back to the capsule before running out of air?