Air at standard conditions enters the compressor shown in the figure below at a rate of 10 ft³/s. The air leaves the tank through a 1.2 in. diameter pipe with a density of 0.0035 slug/ft³ and a uniform speed of 700 ft/s. Determine the average time rate of change of air density within the tank.

10 ft³/s
0.00238 slug/ft³

tank volume = 20 ft³

1.2 in.

700 ft/s
0.0035 slug/ft³