

1. particle  
density

$$f_s(\bar{x}, \bar{v}, t) = C_s(\bar{x}, t) f_{M_s}(\bar{v})$$

$$C_s(\bar{x}, t) = ?$$

• Trivial. Do not overthink.

•  $n_s(\bar{x}, t)$  is a result in itself. You do not have to find an expression for it.

2. No hints.

3. Follow hints in problem description.

• Use divergence theorem to get rid of a final excess term.