November 19th, 2021
PHYS -512

Jules Faucher
260926201

Problem 3:

First, we take a plane (u,v) where $0 < u < \sqrt{P(v/u)}$

This expression can be put in terms of v instead while $u \to 1$ since we care about the ratio between u and v anyway.

$$u = \sqrt{P(v/u)} = \sqrt{e^{-v/u}} = e^{-v/2u}$$

$$\ln u = \ln\left[e^{-v/2u}\right]$$

$$\ln u = -v/2u$$

$$-2u \ln u = v$$

$$\therefore \quad 0 \le v \le -2u \ln u \quad \text{if} \quad 0 \le u \le 1$$