

WEEKLY PARTICIPATION 2

Let x, y , and z be independent random variables with $x \sim \mathcal{N}(\mu_1, \sigma_1^2)$, $y \sim \mathcal{N}(\mu_2, \sigma_2^2)$, and $z \sim \text{Bern}(p)$, then define

$$s = z \cdot x + (1 - z) \cdot y.$$

Do the following:

- Write out the pdf of s ,

$$p_s(u) = \dots$$

- Plot p_s on the interval $[-4, 7]$. In the plot, let $p = \frac{1}{3}$, $\mu_1 = -1$, $\sigma_1^2 = \frac{1}{2}$, and $\mu_2 = 2$, $\sigma_2^2 = 4$.