

# MECH 6325 HW 1

$$7) \quad X = \mathcal{N}(0, 4) \quad Y = \mathcal{N}(1, 9)$$

$$Z = X + 2Y \quad Z = g(X, Y)$$

$$= \mathcal{N}(\mu_x + 2\mu_y, (1\sigma_x)^2 + (2\sigma_y)^2)$$

$$= \mathcal{N}(0 + 2(1), (2^2 + (2(3))^2))$$

$$\boxed{Z = \mathcal{N}(2, 40)}$$

$$\boxed{f_Z(z) = \frac{1}{\sqrt{80\pi}} e^{-\frac{(z-2)^2}{80}}}$$