

Let  $X_1$ ,  $X_2$ , and  $X_3$  be a random sample from a population that is  $N(20, 16)$ .

1. What is the distribution of  $X_1$ ? Of  $X_2$ ? Of  $X_3$ ? Why?
2. Are  $X_1$ ,  $X_2$ , and  $X_3$  independent? Why?
3. Let  $U = X_1 + X_2 + X_3$ . What are the mean and variance of  $U$ ?
4. Let  $V = \frac{1}{3}(X_1 + X_2 + X_3)$ . What are the mean and variance of  $V$ ?
5. Let  $W = \frac{1}{3}(X_1 + X_2 + X_3) + 10$ . What are the mean and variance of  $W$ ?