Probability for Statistics
Unseen Problem 2

Suppose X and Y are random variables on a probability space $(\Omega, \mathcal{F}, \Pr)$. Verify that the following are random variables. *You may find it easier to verify the necessary and sufficient condition given in Proposition 2.9 for a function to be a random variable.*

1. $T = X + c$ for c constant.
2. $U = X^2$.
3. $V = \min(X, Y)$.
4. (harder) $W = X + Y$. *Hint: if $X + Y > z$ then $X > z - Y$. Between two distinct real numbers there exists a rational number.*
5. $Z = XY$.