28.—31. Please complete Interval Games exercises 5, 6, 7, and 8. You may assume CDF solutions are differentiable and therefore expected payoffs can be calculated with integrals of the form \( \int A(x,y)F'(x) \, dx \).

32. Suppose a person is choosing between A, B, and C. The independence axiom of expected utility theory says that a rational person prefers A to B if and only if he prefers a \( pA, (1 - p)C \) lottery to a \( pB, (1 - p)C \) lottery for any probability \( p \). Here is a test to check whether or not this axiom is reasonable.

When people are given the choice to participate in one of these two lotteries:

- **Lottery 1:** There is a 66% chance of $2400, a 33% chance of $2500, and a 1% chance of $0.
- **Lottery 2:** There is a 100% chance of $2400,

many people choose lottery 2. To them, the potential extra $100 is not worth the risk of receiving nothing.

Now consider these two lotteries:

- **Lottery 3:** There is a 67% chance of $0 and a 33% chance of $2500.
- **Lottery 4:** There is a 66% chance of $0 and a 34% chance of $2400.

Given the option of choosing between lotteries 3 and 4, many people choose lottery 3. However, anybody who chooses lottery 2 over 1 and lottery 3 over 4 is violating the independence axiom and therefore cannot be a rational person! Carefully describe why such preferences violate the axiom.