Warm-Up: Odd Dice
Prepared by Mark on March 3, 2025

Problem 1:

We say a set of dice $\{A, B, C\}$ is *nontransitive* if, on average, A beats B, B beats C, and C beats A. In other words, we get a counterintuitive "rock - paper - scissors" effect.

Create a set of nontransitive six-sided dice.
Hint: All sides should be numbered with positive integers less than 10.

Problem 2:

Now, consider the set of six-sided dice below:
- Die A: $4, 4, 4, 4, 4, 9$
- Die B: $3, 3, 3, 3, 8, 8$
- Die C: $2, 2, 2, 7, 7, 7$
- Die D: $1, 1, 6, 6, 6, 6$
- Die E: $0, 5, 5, 5, 5, 5$

On average, which die beats each of the others? Draw a diagram.

Problem 3:

Now, say we roll each die twice. What happens to the graph from the previous problem?