STAT/MA 41600
In-Class Problem Set #1: August 23, 2017

1. A row of 5 empty seats is available to Jack and Diane. They choose two (distinct) seats.
1a. How many outcomes are there?
1b. How many events are there?
1c. Consider the event that Jack is immediately on Diane's left. How many outcomes are in this event?
1d. Consider the event that Jack is on Diane's left (possibly with some empty seats in between). How many outcomes are in this event?

2. A student has 4 books: Two are red, one is blue, and one is green. The student is always in a hurry, so she picks two books and puts them in her bag randomly, without looking, and without regard to order.
2a. How many outcomes are there?
2b. How many events are there?
2c. Consider the event that there is at least one red book in her bag. How many outcomes are in this event?

3. Roll a green 6-sided die and a red 6-sided die.
3a. How many outcomes are there?
3b. How many events are there?
3c. How many outcomes have an even sum?
3d. How many outcomes have a sum of 8 or larger?

4. Calculus review.
4a. Fix $x > 0$. Compute $\int_x^\infty 3e^{-3y}\,dy$
4b. $\int_0^\infty \int_x^\infty (5e^{-5x})(3e^{-3y})\,dy\,dx$
4c. $\sum_{x=1}^\infty (3/5)^{x-1}(2/5)$
4d. $\sum_{x=4}^\infty (3/5)^{x-1}(2/5)$