Due Wednesday, June 15, 2022 (11:59 pm)

Assigned problems
Problem 1: A certain brand of shoes comes in 5 different styles, with each style available in 4 distinct colors. If the store wishes to display pairs of these shoes showing all of its various styles and colors, how many different pairs will the store have on display?

5 styles with 4 distinct colors: 5 * 4 = 20
Answer: 20

Problem 2: John is going to graduate from an industrial engineering department in a university by the end of the semester. After being interviewed at two companies he likes, he assesses that his probability of getting an offer from company A is 0.8, and his probability of getting an offer from company B is 0.6. If he believes that the probability that he will get offers from both companies is 0.5, what is the probability that he will get at least one offer from these two companies?

$P(A) = 0.8$, $P(B) = 0.6$, $P(A$ and $B) = 0.5$. $P(A$ or $B)$?
$P(A$ or $B) = P(A) + P(B) - P(A$ and $B) = 0.8 + 0.6 - 0.5$
Answer: 0.9

Problem 3: A box contains 500 envelopes, of which 75 contain $100 in cash, 150 contain $25, and 275 contain $10. An envelope may be purchased for $25. What is the sample space for the different amounts of money? Assign probabilities to the sample points and then find the probability that the first envelope purchased contains less than $100.

Answers: all listed below
$S = \{\$10, \$75, \$100)$
$P(\$10) = 275/500 = 0.55$
$P(\$25) = 150/500 = 0.3$
$P(\$100) = 75/500 = 0.15$
$P(1^{st}$ envelope $<\$100) = P(\$25) + P(\$10) = 0.55 + 0.3 = 0.85$

Problem 4: Three cards are drawn in succession, without replacement, from an ordinary deck of playing cards. Find the probability that the event $A_1 \cap A_2 \cap A_3$ occurs, where A_1 is the event that the first card is a red ace, A_2 is the event that the second card is a 10 or a jack, and A_3 is the event that the third card is greater than 3 but less than 7.

3 cards picked no replacement: Totals will be, 52 51 50, for each successive draw
$P(A1) = 2/52$ because there are 2 red aces
$P(A2) = 8/51$ because 4 10s and 4 Jacks
$P(A3) = 12/50$ because 3 cards between 3 and 7 and 4 suits
$P(Event) = 2/52 * 8/51 * 12/50$
Answer: 8/5525 or 0.001