

Sample Math 166 Questions

- 1) A jeweler makes three kinds of rings out of white and yellow gold. A Celtic ring uses 3 grams of white gold and 2 grams of yellow gold. A Roman ring uses 1 gram of white gold and 1 gram of yellow gold. A Greek ring uses 6 grams of white gold and 3 grams of yellow gold. The jeweler has 27 grams of white gold and 18 grams of yellow gold. How many of each kind of ring can she make?
- 2) Link has \$17,300 to invest. He decides to invest in three different companies. The QX company costs \$130 per share and pays dividends of \$1.50 per share each year. The RY company costs \$75 per share and pay dividends of \$1.00 per share each year. The KZ company costs \$90 per share and pays \$2.00 per share per year in dividends. Link wants to have twice as much money in the RY company as in the KZ company. Link also wants to earn \$251 in dividends per year. How much should Link invest in each company to meet his goals?
- 3) Matrix **F** below shows the number of stuffed animals sold at a local shop during a month. The daddy animals sell for \$7.00, the mommies for \$6.00 and the babies for \$4.00. Find a matrix **G** such that the product of matrix **G** and matrix **F** will show the revenue, **R**, for selling each kind of animal.

$$\mathbf{F} = \begin{matrix} & \text{daddy} & \text{mommy} & \text{baby} \\ \text{horse} & \begin{bmatrix} 15 & 12 & 22 \end{bmatrix} \\ \text{dog} & \begin{bmatrix} 21 & 14 & 19 \end{bmatrix} \\ \text{cat} & \begin{bmatrix} 23 & 25 & 17 \end{bmatrix} \end{matrix}$$

- 4) A family of 3, a family of 4 and a family of 6 go to the movies. How many ways can they sit in a row if each family stays together.
- 5) Shade the region $(A \cap B) \cup C^c$ on a Venn diagram.
- 6) A sample of movie theater seats is examined and the number of pieces of gum under each seat is counted. The table below shows the results of this experiment:

Number of seats	11	10	9	8	7	6	5	4
Number of pieces of gum	1	2	3	4	5	6	7	8

Find the following: Mean, Median, Mode and Standard Deviation

- 7) A high school has 2400 students. There is a 3% chance that a student will get a case of the cooties during a semester. What is the expected number of cases of cooties during a semester? What is the standard deviation in the number of cases of cooties during a semester? Use the normal curve approximation to the binomial distribution to find the probability that between 80 and 100 students will get the cooties during a semester.
- 8) The weight of a medium apple can be closely approximated by the normal distribution with a mean of 200 grams and standard deviation of 12 grams. What is the weight of an apple in the 80th percentile? In a group of 50,000 apples, how many will weigh less than 180 grams? What weights bracket the middle 50% of the population?

- 9) Bill and Sue play a game with marbles. Each player has a blue and a green marble. They choose one at random and put it on the table. If the marbles are different colors, Sue wins \$10. If the marbles are both blue, Bill wins \$7. If the marbles are both green, Bill wins \$3. What is the payoff matrix for this game?
- 10) There is a fruit market that has 120 oranges, 500 cherries, and 200 apples. Of these, there are 4 rotten oranges, 100 rotten cherries, and 10 rotten apples. What's the probability that a Tucker will select 2 rotten oranges of 2 oranges he picked, 1 rotten apple of 1 apple he picked, and 30 rotten cherries of 40 cherries he picked?
- 11) A pouch contains 5 yellow and 7 blue marbles and a box contains 4 yellow and 6 blue marbles. A marble is chosen from the pouch and transferred to the box. A marble is then drawn from the box. What is the probability that the transferred ball was blue given that the second ball drawn was yellow?
- 12) One hundred Aggies were surveyed concerning whether or not they liked the following movies from the past decade. The results are as follows:
- 71 liked Good Will Hunting
 - 5 liked The Sixth Sense and Hoosiers, but not Good Will Hunting
 - 8 liked Hoosiers only
 - 32 liked exactly two of these three movies.
 - 22 liked Good Will Hunting and The Sixth Sense
 - 5 did not like any of these three movies
 - 4 liked all three of these movies
- How many students surveyed said they liked The Sixth Sense ONLY?
- 13) Mark and Patrice buy a house for \$102,000. They pay \$15,000 down and take out a 30 year loan at 6.5% interest rate for the remaining amount.
- What are their monthly payments?
 - How much interest will they end up paying?
 - How much of the first payment is interest?
- 14) The "We-Need-Money" club is holding a raffle in which there will be 1 first place prize of \$2000, 5 second place prizes of \$500, and 7 third place prizes of \$50. If it costs \$3 to play the raffle and they sell 5000 tickets, what is the expected value of X, if X represents the net winnings for purchasing one ticket?
- 15) The quantity demanded for model Corvettes is 8000 if the price is \$20. If the price goes up to \$25, the quantity demanded goes down to 6000. The supply equation for these model Corvettes is $p=1.34x+12$. Find the equilibrium point for the supply and demand equations.