

## HW #3

### **Question 1**

For a group of people, the probability of having blond hair is 25%. The probability of having blond hair and blue eyes is 10%. What is the probability that person has blue eyes given they have blond hair?

### **Question 2**

The label on a medicine bottle claims that there is a 14% chance of experiencing insomnia. There is a 5% chance of experiencing both a headache and insomnia. What's the probability that a person who takes this medicine has a headache given they have insomnia?

### **Question 3**

In a factory that produces bolts, three machines—A, B, and C—are responsible for manufacturing 25%, 35%, and 40% of the total bolts, respectively. The defect rates of these machines differ: machine A produces 5% defective bolts, machine B produces 4% defective bolts, and machine C produces 2% defective bolts. A bolt is randomly selected from the overall production, and it is found to be defective. What is the probability/likelihood that this defective bolt was produced by machine B?

### **Question 4**

In a test an examinee either guesses, copies or knows the answer to a multiple-choice question with four choices. The probability that he makes a guess is  $\frac{1}{3}$  and the probability that he copies the answer is  $\frac{1}{6}$ . Given that the probability of his answer being correct when he copied it is  $\frac{1}{8}$ , what is the probability that he knew the answer to the question, considering the probability that his answer is correct if he copied it?