1. Hydraulic landing assemblies coming from an aircraft rework facility are each inspected for defects. Historical records indicate that 8% have defects in shafts only, 6% have defects in bushings only and 2% have defects in both shafts and bushings.

a) Draw a Venn Diagram displaying this information (2 Pts)

b) One of the hydraulic assemblies is selected randomly. What is the probability that the assembly has

i) defect in bushing defect (1 Pt.)

\[ 0.08 \] or \[ 8\% \]

ii) a defect in bushing or shaft (1 Pt.)

\[ 0.16 \] or \[ 16\% \]

iii) a defect neither in a bushing nor a shaft (1 Pt.)

\[ 0.84 \] or \[ 84\% \]

iv) a defect in bushing or shaft, but not both. (1 Pt.)

\[ 0.14 \] or \[ 14\% \]

2. A business order ice orders paper supplies from one of three vendors: 1, 2 or 3. Orders are to be placed on two successive days, one order per day. Thus (2, 3) might denote vendor 2 gets the order on the first day and vendor 3 gets the order on the second day.
a) Find the sample space (i.e. list all possibilities) in this experiment of ordering paper supplies on two successive days. Use set notation. (3 Pts.)

\[ S = \{ (1,1), (1,2), (1,3), (2,1), (2,2), (2,3), (3,1), (3,2), (3,3) \} \]

b) Assume the vendors are selected at random each day. Let A denote the event that the same vendor gets both orders, and B denote the event that vendor 2 gets at least one order.

i) List the elements of A Use set notation (3 Pts.)

\[ A = \{ (1,1), (2,2), (3,3) \} \]

ii) List the elements of B Use set notation (4 Pts)

\[ B = \{ (2,1), (2,3), (2,2), (1,2), (3,2) \} \]

iii) Find the following probabilities: (4 Pts)

\[ P(A) = \frac{3}{9} = \frac{1}{3} \]

\[ P(B) = \frac{5}{9} \]

\[ P(A \cup B) = \frac{3}{9} + \frac{5}{9} - \frac{1}{9} = \frac{7}{9} \]

\[ P(A^c \cap B^c) = P((A \cup B)^c) = 1 - P(A \cup B) = 1 - \frac{7}{9} = \frac{2}{9} \]