Answer on Question #69155 – Math – Statistics and Probability

Question

It is noted that 8% of Kaplan students are left handed if 20 (TWENTY) students are randomly selected, calculate the following:
1) probability that none of them are left-handed;
2) probability that at most 2 are left handed;
3) standard deviation for the number of left-handed student;
4) if 50 classes of 20 students are randomly selected, what is the probability that 10 classes have no left handed students?

Solution

1) $P(X=0)=C_{20}^{0}\cdot 0.08^{0}\cdot 0.92^{20}=0.92^{20}\approx 0.1887.$

2) $P(X\le 2)=P(X=0)+P(X=1)+P(X=2)=C_{20}^{0}\cdot 0.08^{0}\cdot 0.92^{20}+$
$+C_{20}^{1}\cdot 0.08^{1}\cdot 0.92^{19}+C_{20}^{2}\cdot 0.08^{2}\cdot 0.92^{18}=0.7879.$

3) $\sigma=\sqrt{np(1-p)}=\sqrt{20\cdot 0.08\cdot 0.92}\approx 1.2133.$

4)
$P(\text{ no one in a class is left}-\text{handed})=\ 0.92^{20}=\ 0.1887;$
$P(\text{at least one in a class is left}-\text{handed})=1-0.1887\ =\ \ 0.8113;$

$P(10\ c\text{lasses have no left}-\text{handed students})=$
$=C_{50}^{10}\ \cdot\ 0.1887^{10}\ \cdot\ 0.8113^{40}=0.1370.$

Answer: 1) 0.1887; **2)** 0.7879; **3)** 1.2133; **4)** 0.1370.