

MATH 301 P & S I FALL 2005 REVISED 2008 WORKSHEET V NAME: _____
(PLEASE PRINT LEGIBLY)

Show all work. If an answer DNE, explain why it does not exist.

Note the following abbreviations:

PMF: probability mass function.

CDF: cumulative distribution function.

1. Suppose we have the following random variable X defined by

X = x	0	1	2	3	5	else
Pr(X = x)	0.25	0.1	0.05	0.4	0.2	0

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|---------------------------|--|-------------------|----------------------------|
| A. Graph the PMF. | B. Draw a histogramme for the PMF. | C Find the CDF | D. Graph the CDF. |
| E. Find $\Pr(X = 4)$ | F. Find $\Pr(X - 2 > 1)$ | G. Compute $E[X]$ | H. Compute $\text{Var}[X]$ |
| I. Compute $\text{SD}[X]$ | J. Approximate $\text{SD}[X]$ to 4 decimal place accuracy. | | K. Compute μ |
| L. Compute σ^2 | M. Find the mode. | | |

2. Suppose we have the following random variable X defined by

X = x	-3	-2	-1	0	1	2	3	else
Pr(X = x)	0.3	0.1	0.07	0.06	0.07	0.1	0.3	0

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|--|------------------------------------|---------------------------|-------------------|
| A. Graph the PMF. | B. Draw a histogramme for the PMF. | C Find the CDF | D. Graph the CDF. |
| E. Find $\Pr(X \leq 0)$ | F. Find $\Pr(X = 4)$ | G. Find $\Pr(X \leq 1)$ | |
| H. Compute $E[X]$ | I. Compute $\text{Var}[X]$ | J. Compute $\text{SD}[X]$ | |
| K. Approximate $\text{SD}[X]$ to 4 decimal place accuracy. | | | |
| L. Find the mode. | | | |

3. Suppose $X \sim g(x)$ where $g(x)$ a probability mass function and $G(x)$ a cumulative distribution function where

$$\text{the c. d. f. is given as } G(X \leq x) = \begin{cases} 0 & x < -1 \\ \frac{1}{4} & -1 \leq x < 0 \\ \frac{7}{12} & 0 \leq x < 2 \\ \frac{19}{24} & 2 \leq x < 3 \\ 1 & x \geq 3 \end{cases}$$

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|--|------------------------------------|---------------------------|
| A. Find the PMF | B. Draw a histogramme for the PMF. | C. Graph the CDF. |
| D. Find $\Pr(X \leq 0)$ | E. Find $\Pr(X = 1)$ | F. Find $\Pr(X \leq 1)$ |
| G. Compute $E[X]$ | H. Compute $\text{Var}[X]$ | I. Compute $\text{SD}[X]$ |
| J. Approximate $\text{SD}[X]$ to 4 decimal place accuracy. | | |

4. Suppose $X \sim f(x)$ where $f(x)$ a probability mass function such that
$$f(x) = \begin{cases} \binom{5}{x} \cdot \left(\frac{1}{3}\right)^x \cdot \left(\frac{2}{3}\right)^{(5-x)} & x \in \mathbb{N}_5^* \\ 0 & \text{else} \end{cases}$$

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|------------------------------------|--|-----------------------|----------------------------|
| A. Draw a histogramme for the PMF. | B. Find the CDF | C. Graph the CDF. | D. Find $\Pr(X \leq 3)$ |
| E. Find $\Pr(X = 4)$ | F. Find $\Pr(X - 2 > 1)$ | G. Compute $E[X]$ | H. Compute $\text{Var}[X]$ |
| I. Compute $\text{SD}[X]$ | J. Approximate $\text{SD}[X]$ to 4 decimal place accuracy. | K. Compute μ | |
| L. Compute σ^2 | M. Find the mode. | N. Compute η_3 . | O. Compute η_4 . |

5. Suppose $X \sim j(x)$ where $j(x)$ a probability mass function such that
$$j(x) = \begin{cases} \binom{5}{x} \cdot \left(\frac{1}{2}\right)^x \cdot \left(\frac{1}{2}\right)^{(5-x)} & x \in \mathbb{N}_5^* \\ 0 & \text{else} \end{cases}$$

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|------------------------------------|-----------------------|----------------------------|---------------------------|
| A. Draw a histogramme for the PMF. | B. Find the CDF | C. Find $\Pr(X \leq 3)$ | D. Find $\Pr(X = 4)$ |
| E. Find $\Pr(X - 2 > 1)$ | F. Compute $E[X]$ | G. Compute $\text{Var}[X]$ | H. Compute $\text{SD}[X]$ |
| I. Compute η_3 . | J. Compute η_4 . | | |

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6. Suppose $X \sim h(x)$ where $h(x)$ a probability mass function such that
$$h(x) = \begin{cases} \binom{5}{x} \cdot \left(\frac{3}{4}\right)^x \cdot \left(\frac{1}{4}\right)^{(5-x)} & x \in \mathbb{N}_5^* \\ 0 & \text{else} \end{cases}$$

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|------------------------------------|-----------------------|----------------------------|---------------------------|
| A. Draw a histogramme for the PMF. | B. Find the CDF | C. Find $\Pr(X \leq 3)$ | D. Find $\Pr(X = 4)$ |
| E. Find $\Pr(X - 2 > 1)$ | F. Compute $E[X]$ | G. Compute $\text{Var}[X]$ | H. Compute $\text{SD}[X]$ |
| I. Compute η_3 . | J. Compute η_4 . | | |