

Please write **Your name:** \_\_\_\_\_

You may leave your answer in terms of sums, products, factorials or binomial coefficients, and fractions. There is NO need to simplify. NO calculators are needed.

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Suppose  $X$  has the following p.d.f.

$$f(x) = \begin{cases} a(x-1) & \text{if } 1 \leq x \leq 3 \\ 0 & \text{otherwise} \end{cases}$$

(1)  $a = \frac{1}{2}$

(2)  $\mathbb{P}(X \leq 2) = \frac{1}{4}$

Suppose  $X$  has the following p.d.f.

$$f(x) = \begin{cases} \frac{1}{4} & \text{if } -2 \leq x \leq 2 \\ 0 & \text{otherwise} \end{cases}$$

(3)  $\mathbb{E}X = 0$

(4)  $\text{Var}(X) = \frac{4}{3}$

Suppose  $X$  has the following p.d.f.

$$f(x) = \begin{cases} \frac{1}{x^2} & \text{if } x \geq 1 \\ 0 & \text{otherwise} \end{cases}$$

(5)  $\mathbb{P}(X \leq 3) = \frac{2}{3}$

(6) Can you find  $\mathbb{E}X$ ? Explain your answer: the integral diverges and  $\mathbb{E}X = +\infty$

(End of the quiz)