

Please write **Your name:** _____

Show all work: either write at least a sentence explaining your reasoning, or annotate your math work with brief explanations. Correct answer with no solution will give only a partial credit. There is NO need to simplify, and NO calculators are allowed. You may leave your answer in terms of sums, products, factorials or binomial coefficients, and fractions.

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- (1a) Suppose that X is a random variable with the outcomes $\{-1, 0, 1, 2\}$. The corresponding probabilities are given by

$$\mathbb{P}(X = -1) = \frac{1}{4}, \quad \mathbb{P}(X = 0) = \frac{1}{4}, \quad \mathbb{P}(X = 1) = \frac{1}{4}, \quad \mathbb{P}(X = 2) = \frac{1}{4}$$

Find its expected value $\mathbb{E}X$ and $\mathbb{E}X^2$.

Please write your answer here:

$\mathbb{E}X =$	$\mathbb{E}X^2 =$
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- (1b) Find the variance $\text{Var}(X)$ and the standard deviation $SD(X)$

Please write your answer here:

$\text{Var}(X) =$	$SD(X) =$
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(more questions on the next page)

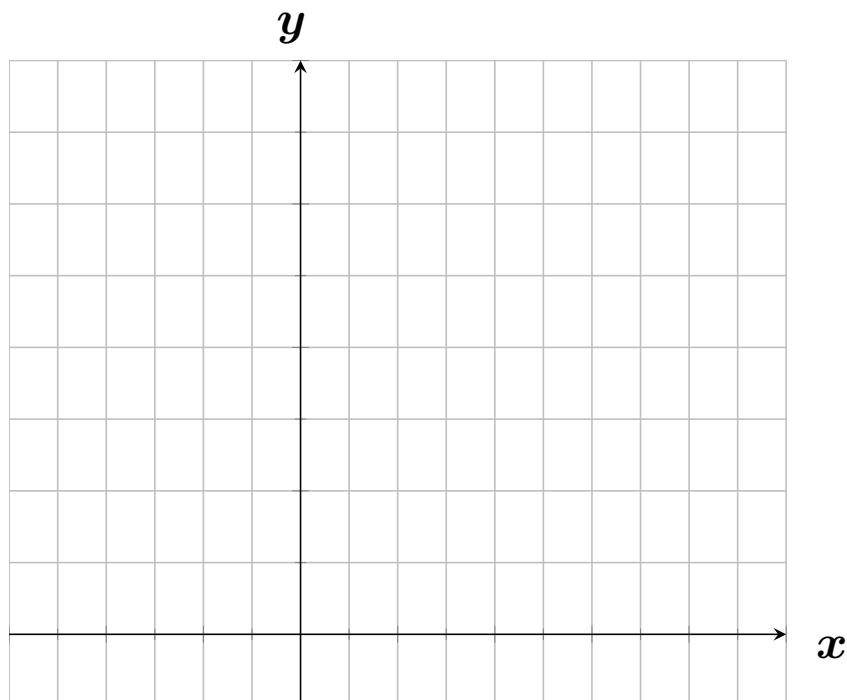
(2a) Suppose that X is a random variable with the outcomes $\{-1, 0, 1, 2\}$. The corresponding probabilities are given as in question (1) by

$$\mathbb{P}(X = -1) = \frac{1}{4}, \quad \mathbb{P}(X = 0) = \frac{1}{4}, \quad \mathbb{P}(X = 1) = \frac{1}{4}, \quad \mathbb{P}(X = 2) = \frac{1}{4}$$

Find the cumulative distribution function F_X of X using the cases provided below.

$$F_X(x) = \begin{cases} 0, & \text{for } -\infty < x < \text{_____} \\ \text{_____}, & \text{for } \text{_____} x \text{_____} \\ \text{_____}, & \text{for } \text{_____} x \text{_____} \\ \text{_____}, & \text{for } \text{_____} x \text{_____} \\ \text{_____}, & \text{for } \text{_____} \leq x < \infty \end{cases}$$

(2b) Plot the cumulative distribution function F_X of X using the chart provided below. Accurately label values at x and y axes.



end of the quiz