Please write Your name:

Show all work. You should either write at a sentence explaining your reasoning, or annotate your math work with brief explanations. There is no need to simplify, and no calculators are needed.

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In this quiz we discuss a random variable X with a probability density function f(x) which is given by f(x) = a(x+1) when -1 < x < 1, and f(x) = 0 for all other x. Here a is a number.

(1) Find a.

(2) Find $\mathbb{P}(X < 0)$.

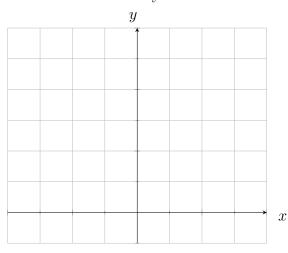
(3) Find $\mathbb{E}X$.

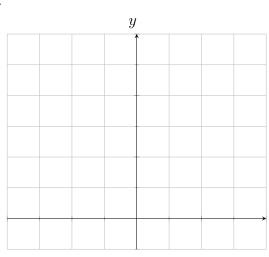
(4) Find $\mathbb{E}X^2$.

(5) Find the cumulative distribution function F(x) using the cases provided below.

 $[(optional\ question\ for\ extra\ credit)]:$

Plot the probability density function f(x) and the cumulative distribution function F(x) using the charts provided below. Accurately label values at x and y axes.





 \boldsymbol{x}