Circle True or False or leave blank. (1 point for correct answer, -1 for incorrect answer, 0 if left blank)

1. True   False   If the mean of a distribution exists, then the standard deviation exists.

2. True   False   Chebyshev's inequality can help us when $0 < k < 1$.

Show your work and justify your answers. Please circle or box your final answer.

3. (10 points)   (a) (4 points) Calculate the standard deviation of $f(x) = \begin{cases} 2x & 0 \leq x \leq 1 \\ 0 & otherwise \end{cases}$.

   The mean is $\frac{2}{3}$.

   (b) (4 points) Calculate the standard deviation of $\{0, 3, 3\}$.

   (c) (2 points) Let f be a PDF with mean 0 and standard deviation 1. For what value of a can we say that $P(-a \leq X \leq a) \geq 0.99 = \frac{99}{100}$?