Assignment 2
AI1110: Probability and Random Variables
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12.13.4.1: State which of the following are not the probability distributions of a random variable. Give reasons for your answer.

(1)

X	0	1	2
Pr X	0.4	0.4	0.2

(2)

X	0	1	2	3	4
Pr X	0.1	0.5	0.2	-0.1	0.3

(3)

Y	-1	0	1
Pr Y	0.6	0.1	0.2

(4)

Z	3	2	1	0	-1
Pr Z	0.3	0.2	0.4	0.1	0.05

solution: 2, 3 and 4 are not the probability distributions of a random variable.
probability distribution of a random variable should satisfy

(a) $\Pr(X_i) > 0$ for i $= 1,2,3.......n$.

(b) $\sum_{i=1}^{i=n} \Pr(X_i) = 1$

In (2) condition (a) fails.
In (3) condition (b) fails.
In (4) condition (b) fails.