Conditions

For the following listed, the x value is first, the px is second... 0, .236, 1, .396, 2, .264, 3, .088, 4, .015, 5, .001. Need to find the mean, expected number, and standard deviation.

Solution

x	0	1	2	3	4	5
P(x)	0.236	0.396	0.264	0.088	0.015	0.001

An expected value (or mean) could be found by using following formula:

$$M(x) = \sum_{i=1}^{6} x_i P(x_i) = 0 \cdot 0.236 + 1 \cdot 0.396 + 2 \cdot 0.264 + 3 \cdot 0.088 + 4 \cdot 0.015 + 5 \cdot 0.001$$
$$= 1.253$$

A standard deviation could be found by using following formula:

$$\sigma = \sqrt{M(x^2) - (M(x))^2}$$

Let's calculate x^2 values and its probabilities:

x^2	0	1	4	9	16	25
$P(x^2)$	0.236	0.396	0.264	0.088	0.015	0.001

$$M(x^2) = \sum_{i=1}^{6} x_i^2 P(x_i^2)$$
$$= 0 \cdot 0.236 + 1 \cdot 0.396 + 4 \cdot 0.264 + 9 \cdot 0.088 + 16 \cdot 0.015 + 25 \cdot 0.001$$
$$= 2.509$$

$$\sigma = \sqrt{M(x^2) - (M(x))^2} = \sqrt{2.509 - 1.253^2} = \sqrt{0.938991} = 0.969015$$

Answer:

$M(x) = 1.253$

$\sigma = 0.969015$

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