AxM: Curso SOA P
Tarea 5

Ejercicio 1

An insurance company determines that N, the number of claims received in a week, is a random variable with $P[N=n]=\frac{1}{2^{n+1}}$ where $n \geq 0$. The company also determines that the number of claims received in a given week is independent of the number of claims received in any other week.

Calculate the probability that exactly seven claims will be received during a given two-week period.

(A) 1/256
(B) 1/128
(C) 7/512
(D) 1/64
(E) 1/32

Ejercicio 2

Let X be a discrete random variable with probability function $P(X = x) = 2/3^x$ for $x = 1, 2, 3, \ldots$

Determine the probability that X is even.

(A) $1/4$

(B) $2/7$

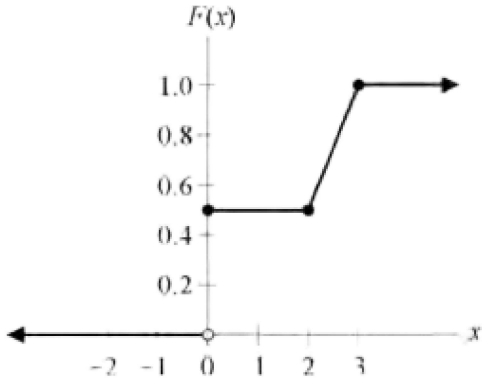
(C) $1/3$

(D) $2/3$

(E) $3/4$

Ejercicio 3

The figure below shows the cumulative distribution function of a random variable, X.



Calculate $E(X)$.

(A) 0.00
(B) 0.50
(C) 1.00
(D) 1.25
(E) 2.50

Ejercicio 4

A probability distribution of the claim sizes for an auto insurance policy is given in the table below:

Claim Size	Probability
20	0.15
30	0.10
40	0.05
50	0.20
60	0.10
70	0.10
80	0.30

Calculate the percentage of claims that are within one standard deviation of the mean claim size.

(A) 45%
(B) 55%
(C) 68%
(D) 85%
(E) 100%

Ejercicio 5

A random variable X has the cumulative distribution function

$$F(x)=\begin{cases}0, & x<1\\ \dfrac{x^2-2x+2}{2}, & 1\le x<2\\ 1, & x\ge 2.\end{cases}$$

Calculate the variance of X.

(A) 7/72
(B) 1/8
(C) 5/36
(D) 4/3
(E) 23/12

Ejercicio 6

Let X be a continuous random variable with density function

$$f(x) = \begin{cases} \dfrac{|x|}{10}, & -2 \le x \le 4 \\ 0, & \text{otherwise.} \end{cases}$$

Calculate the expected value of X.

(A) 1/5
(B) 3/5
(C) 1
(D) 28/15
(E) 12/5

Respuestas

1. D
2. A
3. D
4. A
5. C
6. D

Práctica adicional

Ejercicios de la guía gratuita de la SOA para el examen Probability :

42, 52, 57, 74, 91, 98, 111, 118, 129, 166, 232, 244, 289, 294, 308, 317, 328, 343, 352, 360, 405, 443, 475, 491, 495, 565, 571