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| **CMP020N205S Mathematics for Data Science 2022/23** |

**Week-3 Continuous Variables Distribution**

**Answer the following questions**

1. Let XX be a random variable with PDF given by

A picture containing text

Description automatically generated

1. Find the constant c
2. Find EX and Var(X).
3. Find P(X≥1/2)

Answer: Text, letter

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2. Let XX be a continuous random variable with PDF

Text

Description automatically generated with medium confidence

Find P(X≤2/3|X>1/3)

Text

Description automatically generated with medium confidence

3. The continuous random variable *X* is uniformly distributed over the interval [–1, 3]. Find

(*a*) E(*X* )

(*b*) Var (*X* )

(*c*) E(*X* 2)

(*d*) P(*X* < 1.4)

A total of 40 observations of *X* are made.

(*e*) Find the probability that at least 10 of these observations are negative.

Solution: Table

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5. The continuous random variable *X* is uniformly distributed over the interval [–2, 7].

(*a*) Write down fully the probability density function f(*x*) of *X*.

(*b*) Sketch the probability density function f(*x*) of *X*.

Find

(*c*) E(*X* 2),

(*d*) P(– 0.2 < *X* < 0.6).

Solution:

Chart, box and whisker chart

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