* 1. **Median, mode, percentiles.**

|  |  |
| --- | --- |
| Discrete |  |
| Continuous |  |

* Median:
* Mode:

|  |  |
| --- | --- |
| Discrete |  |
| Continuous |  |

* Percentiles:
  1. **Tail weight measures.**

|  |  |
| --- | --- |
| Light-tailed |  |
| Heavy-tailed |  |

* Moments:
* Survival function:

|  |  |
| --- | --- |
| X is light-tailed than Y |  |
| X is heavy-tailed than Y |  |

* Hazard rate function

|  |  |
| --- | --- |
| Light-tailed | h(x) is increasing |
| Heavy-tailed | h(x) is decreasing |
| Medium-tailed | h(x) is constant |

* Mean excess loss function

|  |  |
| --- | --- |
| Light-tailed | e(x) is decreasing |
| Heavy-tailed | e(x) is increasing |
| Medium-tailed | e(x) is constant |

* 1. **Risk measures**
* Volume-at-risk measure

we solve to x then once we have the value of x, x=

* Tail-value-at-risk
  1. **Parametric and scale distributions**

Proving that a function of x of any distribution has the same distribution of function of cx, where c is a constant

1.5

**1.6 Data dependent distribution**

Finding its mass function (the frequency of the data)

**Chapter 2**

**2.1 Ordinary deductible:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | CDF | PDF | Mean | MGF |
| Cost per loss |  |  |  |  |
| Cost per payment |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | CDF | PDF | Mean | MGF |
| Cost per loss |  |  |  |  |
| Cost per payment |  |  |  |  |

**2.2 Franchise deductible:**

**2.3 Policy limit**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | CDF | PDF | Mean | MGF |
|  |  |  |  |  |

**2.4 Coinsurance**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | CDF | PDF | Mean | MGF |
|  |  |  |  |  |

**2.5 Inflation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | CDF | PDF | Mean | MGF |
|  |  |  |  |  |

**2.6 Combination**

**2.7 Loss elimination ratio**

**2.8 Impact of deductible on the number of payment**

**GOAL: Find the distribution of**

**Chapter 3**

**3.1 Methods of moment:**

* **COMPLETE DATA:**

**3.2.1 Maximum likelihood method:**

**3.2.2 Maximum likelihood method for grouped data:**

|  |  |
| --- | --- |
| Interval | # of observation |
|  |  |
|  | : |
|  |  |

**3.2.3 Maximum likelihood method for mixed data:**

|  |  |
| --- | --- |
| Interval | # of observation |
|  |  |
|  | : |
|  |  |
|  |  |
| : | : |
|  |  |

* **INCOMPLETE DATA:**

**Censored data:**

* Left-censored data: an observation less than value d is recorded as d
* Right-censored data: an observation greater than value u is recorded as u

**Truncated data:**

* Left-truncated data: an observation less than value d is not recorded
* Right-truncated data: an observation greater than value u is not recorded

**3.3 Method of percentiles:**

1. Order data
2. Find p

**3.4 Fisher information**

**Chapter 4**

**4.1 K-S test**

* Hypothesis:
* Statistic:
* Decision: if

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |

**4.2 A-D test**

Level of confidence:

|  |  |  |
| --- | --- | --- |
| 0.1 | 0.05 | 0.01 |
| 1.933 | 2.492 | 3.857 |

Reject if

* 1. **Chi-square test**

|  |  |
| --- | --- |
| Interval | # of observation |
|  |  |
|  | : |
|  |  |

The chi-square statistics:

Reject if