Answers: PMFs, PDFs, and CDFs

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SUMMARY

Answers to questions relating to the guide on PMFs, PDFs, and CDFs.

*These are the answers to [Questions: PMFs, PDFs, and CDFs.]*

**Please attempt the questions before reading these answers!**

## Q1

1.1

The given PMF is valid because:

**Non-negativity**: All

**Honesty**: The sum of all probabilities equals 1:

.

1.2

The given PMF is valid because:

**Non-negativity**: All

**Honesty**: The sum of all probabilities equals 1:

1.3

The completed PMF table for the biased coin toss is:

|  | Heads | Tails |
| --- | --- | --- |
|  | 0.3 | 0.7 |

This is a valid PMF because:

**Non-negativity**: Both

**Honesty**: The sum of both probabilities equal 1:

1.4

This is not a valid PMF since it fails the honesty condition:

**Honesty**: The sum of the given probabilities does not equal 1:

1.5

1. The PMF for the given scenario is:

|  | Red | Blue | Green |
| --- | --- | --- | --- |
|  | 0.5 | 0.3 | 0.2 |

This is a valid PMF because:

**Non-negativity**: All

**Honesty**: The sum of all three probabilities equals to 1:

1.6

1. For the given PMF to be valid, you must have
2. For ,

## Q2

2.1

This is a valid PDF because:

**Non-negativity**: for all values of .

**Honesty**:

2.2

This is a valid PDF because:

**Non-negativity**: for all values of

**Honesty**:

2.3

This is a valid PDF because:

**Non-negativity**: for all values of

**Honesty**:

2.4

This is not a valid PDF since it does not meet the honesty condition:

**Honesty**:

Calculating the individual integrals:

And adding them together:

2.5

1. For the given PDF to be valid, you must have

2.6

This is a valid PDF because:

**Non-negativity**: for all values of

**Honesty**:

Calculating the individual integrals:

And adding them together gives:

## Q3

3.1

3.2

1. The CDF for values 0.5, 1, and 2:

3.3

1. The CDF at points 4, 5, and 6:

3.4

1. This is not a valid CDF because the CDF should be non-decreasing as increases.

## Version history and licensing

v1.0: initial version created 12/24 by Sophie Chowgule

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