edX   **MITx: 6.041x Introduction to Probability - The Science of Uncertainty**

Unit 6: Further topics on random variables > Lec. 11: Derived distributions > Lec 11 Derived distributions vertical

🔖 Bookmark

Exercise: Linear functions of discrete r.v.'s

(2/2 points)

The random variables X and Y obey a linear relation of the form $Y = aX + b$ and have the PMFs shown in the diagram. Find the values of a and b.
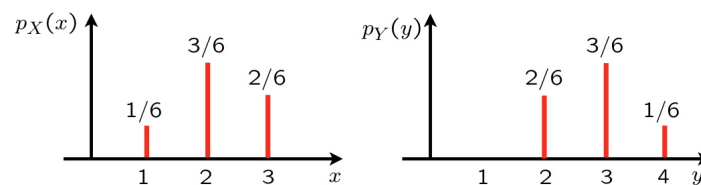
$a = $ | -1 | ✔ **Answer:** -1

$b = $ | 5 | ✔ **Answer:** 5

Answer:
Because the entries of the PMF of Y appear in the opposite order than the entries of the PMF of X, we know that a has to be negative. Furthermore, the spread of the PMF of Y is the same as the spread of the PMF of X, and therefore, $a = -1$. The random variable $-X$ takes values in the set $\{-3, -2, -1\}$. To obtain the given PMF of Y, we need to shift it (to the right) by $b = 5$.

You have used 1 of 2 submissions

Lec. 12: Sums of independent r.v.'s; Covariance and correlation
Exercises 12 due Mar 30, 2016 at 23:59 UTC

Lec. 13: Conditional expectation and variance revisited; Sum of a random number of independent r.v.'s
Exercises 13 due Mar 30, 2016 at 23:59 UTC

Solved problems

Additional theoretical material

Problem Set 6
Problem Set 6 due Mar 30, 2016 at 23:59 UTC

Unit summary

POWERED BY
OPENedX