



Bookmarks

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## Unit overview

**Lec. 5: Probability mass functions and expectations**

Exercises 5 due Mar 02, 2016 at 23:59 UTC

**Lec. 6: Variance; Conditioning on an event; Multiple r.v.'s**

Exercises 6 due Mar 02, 2016 at 23:59 UTC

**Lec. 7: Conditioning on a random variable; Independence of r.v.'s**

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## Solved problems

## Additional theoretical material

## Problem Set 4

Problem Set 4 due Mar 02, 2016 at 23:59 UTC

## Unit summary

Unit 4: Discrete random variables &gt; Lec. 5: Probability mass functions and expectations &gt; Lec 5 Probability mass functions and expectations vertical8



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## Exercise: The expected value rule

(2/2 points)

 Let  $X$  be a uniform random variable on the range  $\{-1, 0, 1, 2\}$ . Let  $Y = X^4$ . Use the expected value rule to calculate  $\mathbf{E}[Y]$ .
 $\mathbf{E}[Y] =$ 

4.5



Answer: 4.5

Answer:

 We are dealing with  $Y = g(X)$ , where  $g$  is the function defined by  $g(x) = x^4$ . Thus,

$$\mathbf{E}[Y] = \mathbf{E}[X^4] = \sum_x x^4 p_X(x) = (-1)^4 \cdot \frac{1}{4} + 0^4 \cdot \frac{1}{4} + 1^4 \cdot \frac{1}{4} + 2^4 \cdot \frac{1}{4} = \frac{1}{4} + \frac{1}{4} + \frac{16}{4} =$$

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