Quiz 14 Solution

April 13, 2018

1. (2 points) Which of the following approximates $\int_0^2 e^{x^2}\,dx$ using a Right Riemann Sum with 20 rectangles?

    (a) $\sum_{i=0}^{\infty} e^{i^2}$

    (b) $\sum_{i=1}^{20} e^{(i/10)^2}$

    (c) $\sum_{i=1}^{20} \frac{1}{10} e^{(i/10)^2}$

    (d) $\sum_{i=1}^{20} \frac{1}{20} e^{(i/20)^2}$

    Solution: First, let's split the interval $[0, 2]$ into 20 even intervals. Each subinterval should have length $\Delta x = \dfrac{b-a}{n} = \dfrac{2-0}{20} = \dfrac{1}{10}$.
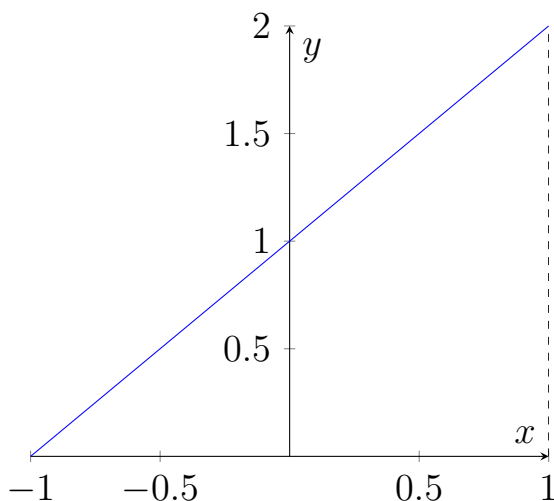
    Now, $x_i = a + i\Delta x = 0 + i\dfrac{1}{10} = \dfrac{i}{10}$. So $f(x_i) = e^{(i/10)^2}$.

    Finally, the Right Riemann Sum is given by $R_{20} = \sum_{i=1}^{n} \Delta x f(x_i) = \sum_{i=1}^{20} \frac{1}{10} e^{(i/10)^2}$.

    Answer: (c)

2. (2 points) Evaluate $\int_{-1}^{1} x + 1\,dx$ by **using geometric formulas**.

    Solution: This is a triangle with base $1 - (-1) = 2$ and height $1 + 1 = 2$ (see the picture). So the area is $\dfrac{1}{2}(2)(2) = 2$.

    Answer: 2

3. (1 point) What are your summer plans?

   Answer: Answers will vary.