5. [5 points] Let $p(x)$ be the probability density function for the price of a meal on South University Avenue where x is given in dollars. The formula of $p(x)$ is given as follow:

$$p(x) = \frac{1}{\sqrt{\pi}} e^{-(x-9)^2}$$

a. [2 points] Write, but do **not** evaluate, an integral that gives the probability of a meal on South University Avenue being between \$8 and \$14.

Solution:

$$\int_8^{14} \frac{1}{\sqrt{\pi}} e^{-(x-9)^2} \ dx.$$

b. [3 points] Write, but do **not** simplify, an expression that estimates your integral in (a) by MID(3). Be sure to write out all the terms in your sum.

Solution: We have $\Delta x = (14 - 8)/3 = 2$, so the subdivisions are: 8 to 10, 10 to 12, 12 to 14. The data points for the MID sum are 9,11,13, and

$$\text{MID}(3) = 2 \cdot \frac{1}{\sqrt{\pi}} (e^{-(9-9)^2} + e^{-(11-9)^2} + e^{-(13-9)^2}).$$