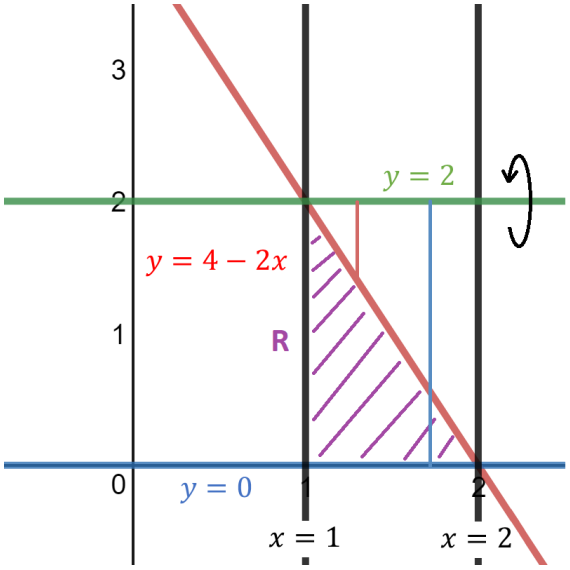
QUIZ 11 SOLUTIONS: LESSONS 13-15
OCTOBER 3, 2018

Write legibly, clearly indicate the question you are answering, and put a box or circle around your final answer. If you do not clearly indicate the question numbers, I will take off points. Write as much work as you need to demonstrate to me that you understand the concepts involved. If you have any questions, raise your hand and I will come over to you.

Fill in the green boxes for the following questions. Each green box is worth 1 point.

1. Consider the region R bounded by

$$y = 4 - 2x, \quad y = 0, \quad x = 1, \quad x = 2.$$



The volume obtained by revolving R about the line $y = 2$ is given by

$$\text{Vol} = \square \int_{\square}^{\square} [(\square\!\square)^2 - (\square\!\square)^2]\, d\square$$

DO NOT EVALUATE.

Solution: We are revolving about a horizontal line and so we will have x-values for bounds and will integrate with respect to x. By the picture, the outer radius is $2 - 0 = 2$ and the inner radius is $2 - (4 - 2x) = 2x - 2$. Putting this all together:

$$\text{Vol} = \boxed{\pi} \int_{\boxed{1}}^{\boxed{2}} [(\boxed{2})^2 - (\boxed{2x - 2})^2]\, d\boxed{x}.$$

2. Fill in the green boxes.

$$\int_0^{\infty} \frac{x}{e^x}\,dx = \lim_{t\to\blacksquare}\int_{\blacksquare}^{\blacksquare} \blacksquare\,dx.$$

DO NOT EVALUATE.

Solution: This is simply

$$\int_0^{\infty} \frac{x}{e^x}\,dx = \lim_{t\to\boxed{\infty}}\int_{\boxed{0}}^{\boxed{t}} \boxed{\frac{x}{e^x}}\,dx.$$