QUIZ 1 SOLUTIONS: LESSON R
AUGUST 23, 2017

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.

1. [1 pt] What is the name of your MA 16020 instructor?

   Solution: My name is Ellen Weld. You need to know this. Seriously, it's not that long. Please guys....

2. Evaluate the following:

   (a) [1 pt] $\int 3x^3\,dx$

   Solution:

   $$\int 3x^3\,dx = \frac{3}{3+1}x^{3+1} + C = \boxed{\frac{3}{4}x^4 + C}$$

   (b) [1 pt] $\int \frac{1}{2}e^x\,dx$

   Solution:

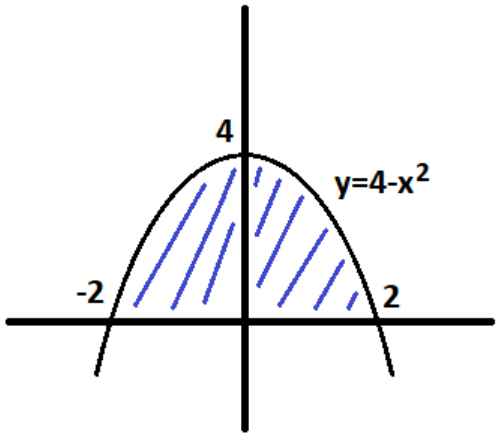
   $$\int \frac{1}{2}e^x\,dx = \boxed{\frac{1}{2}e^x + C}$$

   (c) [1 pt] $\int (-\sin x)\,dx$

   Solution:

   $$\int (-\sin x)\,dx = \boxed{\cos x + C}$$

3. Consider the following:



(a) [2 pts] What definite integral represents the graph above?

Solution: The function is given as $y = 4 - x^2$ and the bounds are $x = -2, x = 2$. So our definite integral is

$$\boxed{\int_{-2}^{2} (4 - x^2)\, dx}$$

(b) [4 pts] What is the value of the definite integral from (a)?

Solution:

$$\begin{aligned}
\int_{-2}^{2} (4 - x^2)\, dx &= 4x - \frac{1}{3}x^3 \Big|_{-2}^{2} \\
&= 4(2) - \frac{1}{3}(2)^3 - \left(4(-2) - \frac{1}{3}(-2)^3\right) \\
&= 8 - \frac{8}{3} - \left(-8 - \frac{1}{3}(-8)\right) \\
&= 8 - \frac{8}{3} + 8 - \frac{8}{3} \\
&= 16 - \frac{16}{3} \\
&= \frac{48}{3} - \frac{16}{3} \\
&= \boxed{\frac{32}{3}}
\end{aligned}$$