QUIZ 21 SOLUTIONS: LESSON 27
APRIL 1, 2019

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. [5 pts] Compute

$$\int_3^6 \int_0^y 5xy\, dx\, dy.$$

Round your answer to 2 decimal places.

$$\int_3^6 \int_0^y 5xy\, dx\, dy = \int_3^6 \frac{5}{2} x^2 y \Big|_{x=0}^{x=y}\, dy$$

$$= \int_3^6 \frac{5}{2} (y)^2 y\, dy$$

$$= \int_3^6 \frac{5}{2} y^3\, dy$$

$$= \frac{5}{2}\left(\frac{1}{4}\right) y^4 \Big|_{y=3}^{y=6}$$

$$= \frac{5}{8} y^4 \Big|_{y=3}^{y=6}$$

$$= \frac{5}{8}\left[6^4 - 3^4\right]$$

$$= \frac{5}{8}\left[1215\right]$$

$$\approx \boxed{759.38}$$

2. [5 pts] Compute

$$\int_0^{\pi/2} \int_0^1 11y^5 \cos(x)\, dy\, dx.$$

Round your answer to 2 decimal places.

$$\int_0^{\pi/2}\int_0^1 11y^5 \cos(x)\, dy\, dx$$

$$= \int_0^{\pi/2} \frac{11}{6} y^6 \cos(x) \Big|_{y=0}^{y=1}\, dx$$

$$= \int_0^{\pi/2} \frac{11}{6} \cos(x)\, dx$$

$$= \frac{11}{6} \sin(x) \Big|_0^{\pi/2}$$

$$= \frac{11}{6} \sin\left(\frac{\pi}{2}\right) - \frac{11}{6} \sin(0)$$

$$\underbrace{\sin\left(\frac{\pi}{2}\right)}_{1} \qquad \underbrace{\sin(0)}_{0}$$

$$= \frac{11}{6} \approx \boxed{1.83}$$

Note: $\int \cos(x)\, dx = +\sin(x) + C$