MATH 213 – QUIZ 9 – 3 APRIL 2012

Answer the following question in the space provided. There is no need to justify your answers. This quiz is worth 5 points.

Compute the iterated integral $\int_0^3 \int_{-2}^0 (x^2y + y^2x)\, dy\, dx$.

$$\int_0^3 \int_{-2}^0 (x^2y+y^2x)\,dy\,dx = \int_0^3 \left(\tfrac{1}{2}x^2y^2+\tfrac{1}{3}y^3x \Big|_{-2}^{0}\right) dx$$

$$= \int_0^3 0 - \left(2x^2 - \tfrac{8}{3}x\right) dx = \int_0^3 \tfrac{8}{3}x - 2x^2\, dx$$

$$= \tfrac{4}{3}x^2 - \tfrac{2}{3}x^3 \Big|_0^3 = \tfrac{4}{3}(9) - \tfrac{2}{3}(27) = 12 - 18$$

$$= -6 //$$

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Answer the following question in the space provided. There is no need to justify your answers. This quiz is worth 5 points.

Compute the iterated integral $\int_0^{\pi/2} \int_1^3 x \cos(y)\, dx\, dy$.

$$\int_0^{\pi/2} \int_1^3 x\cos(y)\,dx\,dy = \int_0^{\pi/2} \left(\tfrac{1}{2}x^2\cos(y) \Big|_1^3 \right) dy$$

$$= \int_0^{\pi/2} \tfrac{9}{2}\cos(y) - \tfrac{1}{2}\cos(y)\,dy = \int_0^{\pi/2} 4\cos(y)\,dy$$

$$= 4\sin(y)\Big|_0^{\pi/2} = 4 - 0 = 4 \;//$$

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Answer the following question in the space provided. There is no need to justify your answers. This quiz is worth 5 points.

Compute the iterated integral $\int_1^2 \int_1^4 \sqrt{\frac{x}{y}}\, dy\, dx$.

$$\int_1^2 \int_1^4 \sqrt{\frac{x}{y}}\, dy\, dx = \int_1^2 \int_1^4 x^{1/2} y^{-1/2}\, dy\, dx$$

$$= \int_1^2 \left(2x^{1/2} y^{1/2} \Big|_1^4 \right) dx = \int_1^2 4x^{1/2} - 2x^{1/2}\, dx$$

$$= \int_1^2 2x^{1/2}\, dx = \frac{4}{3} x^{3/2} \Big|_1^2 = \frac{4}{3}\left(2^{3/2} - 1\right) //.$$