Student: Phong Vo **Date:** 03/18/18	**Instructor:** Chuck Ormsby **Course:** Multi-Variable and Vector Calculus -- Calculus III Spring 2018	**Assignment:** Section 14.1 Homework

1.

Evaluate the iterated integral $\displaystyle\int_{-2}^{3}\int_{0}^{1}18x^5y^2\,dy\,dx$.

$\displaystyle\int_{-2}^{3}\int_{0}^{1}18x^5y^2\,dy\,dx = \underline{\qquad 665 \qquad}$

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2. Evaluate the following iterated integral.

$$\int_{1}^{5}\int_{\frac{3\pi}{2}}^{2\pi} x\,\sin y\,dy\,dx$$

$\displaystyle\int_{1}^{5}\int_{\frac{3\pi}{2}}^{2\pi} x\,\sin y\,dy\,dx = \underline{\qquad -12 \qquad}$

(Simplify your answer.)

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3. Evaluate the iterated integral.

$$\int_{0}^{\ln 4}\int_{1}^{\ln 2} e^{3x+3y}\,dy\,dx$$

$\displaystyle\int_{0}^{\ln 4}\int_{1}^{\ln 2} e^{3x+3y}\,dy\,dx = \underline{\qquad 56 - 7\,e^3 \qquad}$

(Type an exact answer.)

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4. Evaluate the following double integral over the region R.

$$\iint_{R}(x+8y)\,dA; \; R = \{(x,y) : 1 \le x \le 3, \; 1 \le y \le 3\}$$

$\displaystyle\iint_{R}(x+8y)\,dA = \underline{\qquad 72 \qquad}$

(Type an exact answer.)

5. Evaluate the following double integral over the region R.

$$\iint_R 2\sqrt{\frac{x}{y}}\, dA;\ R = \{(x,y):\ 0 \le x \le 4,\ 4 \le y \le 9\}$$

Choose the two integrals that are equivalent to $\iint_R 2\sqrt{\frac{x}{y}}\, dA$.

☐ A. $\displaystyle\int_4^9\int_0^4 2\sqrt{\frac{x}{y}}\, dy\, dx$

☑ B. $\displaystyle\int_0^4\int_4^9 2\sqrt{\frac{x}{y}}\, dy\, dx$

☑ C. $\displaystyle\int_4^9\int_0^4 2\sqrt{\frac{x}{y}}\, dx\, dy$

☐ D. $\displaystyle\int_0^4\int_4^9 2\sqrt{\frac{x}{y}}\, dx\, dy$

Evaluate the integral.

$$\iint_R 2\sqrt{\frac{x}{y}}\, dA = \underline{\quad \frac{64}{3} \quad}$$

6. Evaluate the following double integral over the region R.

$$\iint_R e^{x+4y}\, dy\, dx;\ R = \{(x,y):\ 0 \le x \le \ln 2,\ 1 \le y \le \ln 4\}$$

$$\iint_R e^{x+4y}\, dy\, dx = \underline{\quad 64 - \frac{1}{4}e^4 \quad}$$

(Type an exact answer.)

7. Evaluate the following double integral over the region R.

$$\iint_R 3\left(x^7 - y^7\right)^2 dA;\ R = \{(x,y):\ 0 \le x \le 1,\ -1 \le y \le 1\}$$

Choose the two integrals that are equivalent to $\iint_R 3\left(x^7 - y^7\right)^2 dA$.

☑ A. $\displaystyle\int_{-1}^1\int_0^1 3\left(x^7 - y^7\right)^2 dx\, dy$

☑ B. $\displaystyle\int_0^1\int_{-1}^1 3\left(x^7 - y^7\right)^2 dy\, dx$

☐ C. $\displaystyle\int_{-1}^1\int_0^1 3\left(x^7 - y^7\right)^2 dy\, dx$

☐ D. $\displaystyle\int_0^1\int_{-1}^1 3\left(x^7 - y^7\right)^2 dx\, dy$

Evaluate the integral.

$$\iint_R 3\left(x^7 - y^7\right)^2 dA = \underline{\quad \frac{4}{5} \quad}$$

8. When converted to an iterated integral, the following double integral is easier to evaluate in one order than the other. Find the best order and evaluate the integral.

$$\iint\limits_{R} 4x^3 \, e^{x^2 y} \, dA; \quad R = \{(x,y): 0 \le x \le 2, \, 0 \le y \le 1\}$$

$$\iint\limits_{R} 4x^3 \, e^{x^2 y} \, dA = \underline{\quad 2\,e^4 - 10 \quad}$$

(Type an exact answer in terms of e.)

9. Compute the average value of the following function over the region R.

$$f(x,y) = 9 \sin x \cos y \qquad R = \left\{(x,y): 0 \le x \le \frac{\pi}{2}, \, 0 \le y \le \frac{\pi}{3}\right\}$$

$$\bar{f} = \underline{\quad 27\dfrac{\sqrt{3}}{\pi^2} \quad}$$

(Simplify your answer. Type an exact answer, using radicals as needed. Type your answer in factored form. Use integers or fractions for any numbers in the expression.)

10. Draw the solid region whose volume is given by the following double integral. Then find the volume of the solid.
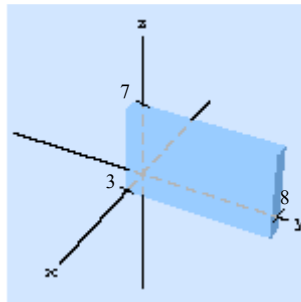
$$\int_{0}^{7} \int_{1}^{3} 8 \, dy \, dx$$

Draw the solid region whose volume is given by the double integral. Choose the correct graph below.
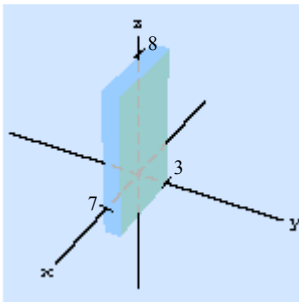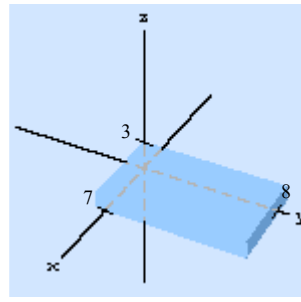
○ A.   ○ B.   ○ C.

Find the volume of the solid.

V = $\underline{\quad 112 \quad}$