MATH 16020: Applied Calculus 2 Quiz 3 (Solutions) Fri., Jan. 27, 2023

Please show **all** your work! Answers without supporting work will not be given credit. Write answers in spaces provided.

Name:_____

1. **[5 pts]** Compute $\displaystyle\int \frac{1}{x\ln(x^7)}\,dx$

Solution:

$$\int \frac{1}{x\ln(x^7)}\,dx \underset{du=\frac{7x^6}{x^7}\,dx \iff \frac{du}{7}=\frac{1}{x}\,dx}{\overset{u=\ln(x^7)}{=\!=\!=}} \int \frac{1}{u}\cdot\frac{du}{7} \qquad \textbf{[3 pt]}$$

$$= \frac{1}{7}\ln|u| + C \qquad \textbf{[1 pt]}$$

$$= \frac{1}{7}\ln|\ln(x^7)| + C \qquad \textbf{[1 pt]}$$

2. **[5 pts]** Compute $\displaystyle\int \frac{5(\ln(x))^4}{x}\,dx$

Solution:

$$\int \frac{5(\ln(x))^4}{x}\,dx \underset{du=\frac{1}{x}\,dx}{\overset{u=\ln(x)}{=\!=\!=}} 5\int u^4\,du \qquad \textbf{[3 pt]}$$

$$= 5\cdot\frac{1}{5}u^5 \qquad \textbf{[1 pt]}$$

$$= u^5$$

$$= (\ln(x))^5 + C \qquad \textbf{[1 pt]}$$