

Quiz 5

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. (5 marks) §6.1 #3 Evaluate the indefinite integral.

$$\begin{aligned} \int x \cos 5x \, dx &= uv - \int v \, du & u &= x & du &= dx \\ &= \frac{x \sin 5x}{5} - \int \frac{\sin 5x}{5} \, dx & v &= \frac{\sin 5x}{5} & dv &= \cos 5x \, dx \\ &= \frac{x \sin 5x}{5} + \frac{\cos 5x}{25} + C \end{aligned}$$

Question 2. (5 marks) §6.1 #17 Evaluate the definite integral.

$$\begin{aligned} \int_1^2 \frac{\ln x}{x^2} \, dx &= \int_1^2 \ln x \cdot \frac{1}{x^2} \, dx & u &= \ln x & du &= \frac{1}{x} \, dx \\ &= [uv]_1^2 - \int_1^2 v \, du & v &= \frac{-1}{x} & dv &= \frac{1}{x^2} \, dx \\ &= \left[-\frac{\ln x}{x} \right]_1^2 - \int_1^2 -\frac{1}{x} \cdot \frac{1}{x} \, dx \\ &= \left[-\frac{\ln 2}{2} + \frac{\ln 1}{1} \right] + \int_1^2 \frac{1}{x^2} \, dx \\ &= -\frac{\ln 2}{2} + \left[-\frac{1}{x} \right]_1^2 \\ &= -\frac{\ln 2}{2} + \left[-\frac{1}{2} + \frac{1}{1} \right] \\ &= \frac{1}{2} - \frac{\ln 2}{2} \end{aligned}$$