

1552 Quiz 3: Sample Questions

May 11, 2023

1 Question 1: Trig Substitution

Evaluate the following integral using the method of trig substitution. No other method will receive credit.

1. $\int \frac{1}{\sqrt{x^2-64}} dx$ becomes $\int \sec(\theta) d\theta$
2. $\int \frac{1}{x^2\sqrt{x^2-4}} dx$ becomes $\int \frac{1}{4} \cos(\theta) d\theta$
3. $\int \frac{1}{(1+x^2)^{3/2}} dx$ becomes $\int \tan^2(\theta) d\theta$
4. $\int \frac{1}{x^2\sqrt{16-x^2}} dx$ becomes $\int \frac{1}{16} \csc^2(\theta) d\theta$
5. $\int \frac{\sqrt{16-x^2}}{x^2} dx$ becomes $\int 4 \cot^2(\theta) d\theta$

2 Question 2: Partial Fraction

Evaluate the integral:

$$1. \int \frac{-x-13}{(x+1)(x-5)} dx \quad \frac{2}{x+1} - \frac{3}{x-5}$$

$$2. \int \frac{5x-12}{(x-3)(x-2)} dx \quad \frac{3}{x-3} - \frac{2}{x-2}$$

$$3. \int \frac{3x+18}{(x+2)(x+5)} dx \quad \frac{4}{x+2} - \frac{1}{x+5}$$

$$4. \int \frac{4x+2}{(x+2)(x-4)} dx \quad \frac{1}{x+2} + \frac{3}{x-4}$$

$$5. \int \frac{x-23}{(x+5)(x-2)} dx \quad \frac{4}{x+5} - \frac{3}{x-2}$$