

Calculus 2: Harder Trig/Trig-Sub Problems

(Q1.) $\int \sin(2 \tan^{-1} x) dx$

(Q2.) $\int \frac{1}{2 + \cos x} dx$, hint: let $t = \tan\left(\frac{x}{2}\right)$

(Q3.) $\int \frac{1}{1 + \sin x + \cos x} dx$

(Q4.) $\int \frac{1}{1 + \sqrt{1 - x^2}} dx$

(Q5.) $\int \left(\frac{x^4}{1 + x^6}\right)^2 dx$

(Q6.) $\int \int \frac{1}{(x^2 - 1)^{2/3}} dx dx$, i.e. find an antiderivative of an antiderivative of $\frac{1}{(x^2 - 1)^{2/3}}$

(Q7.) Given $\int \frac{\sin x}{x} dx = \text{Si}(x) + C$. Integrate $\int \frac{\sin^{-1} x}{\cos^{-1} x} dx$

(Q8.) Given $\int \frac{1}{\sqrt{1 - m \sin^2 x}} dx = F(x | m) + C$. Integrate $\int \frac{1}{\sqrt{1 - x^4}} dx$

#bprplive, 3/2/2021

You Try: Given $\int \frac{\sin x}{x} dx = \text{Si}(x) + C$ and $\int \frac{\cos x}{x} dx = \text{Ci}(x) + C$. Integrate $\int \frac{\cos x}{x + 1} dx$

video solution: <https://youtu.be/JrARB-pJyK4>