

Sep 3 warmups

Use u-sub for $\int_0^{\pi/2} 2 \sin(x) \cos(x) dx$

$$\int 2 \sin(x) \cos(x) dx = 2 \int \sin(x) \cos(x) dx$$

$$u = \sin(x) \quad \frac{du}{dx} = \cos(x) \cdot dx \rightarrow \frac{du}{\cos(x)} = \frac{\cos(x) dx}{\cos(x)}$$

$$dx = \frac{1}{\cos(x)} du \quad \swarrow$$

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$$25 \int 1 \cdot du \rightarrow 2 \cdot \frac{1}{2} u^2 + C \Big|_0^{\pi/2} \rightarrow u^2 + C \Big|_0^{\pi/2}$$

$$= 1$$

Find $\int \sec^2(x) \tan^6(x) \sec^2(x) dx$

$\underbrace{\tan^6(x)}_{u^6} \quad \sec^2(x) = du$

$$= \frac{\tan^7(x)}{7} + \frac{\tan^9(x)}{9} + C$$