

Monday, February 6, 2017 -
Late Start

- * **New Seats**
- * **New Calendar**
- * **New Chapter - Chapter 7**
- * **7.2 - Antiderivatives and Substitution**



What's your sine?

It must be $\pi/2$ because you're the one.

7.2 Substitution

$$\textcircled{1} \int \frac{6 \cos t}{(2 + \sin t)^2} dt = \int \frac{6}{u^2} du = 6 \cdot \frac{-1}{u} + C$$

$$u = 2 + \sin t$$
$$\frac{du}{dt} = \cos t$$
$$du = \cos t dt$$

$$= \boxed{\frac{-6}{2 + \sin t} + C}$$

$$\textcircled{2} \int \tan \theta d\theta = \int \frac{\sin \theta}{\cos \theta} d\theta = \int \frac{1}{u} du$$

$$u = \cos \theta$$
$$\frac{du}{d\theta} = -\sin \theta$$
$$du = -\sin \theta d\theta$$

$$\text{OR } \int \frac{-du}{u}$$
$$= -\ln|u| + C$$
$$= \boxed{-\ln|\cos \theta| + C}$$

$$\textcircled{3} \int \sin^{10} x \cos x dx = \int (\sin x)^{10} \cos x dx =$$

$$u = \sin x$$
$$\frac{du}{dx} = \cos x$$
$$du = \cos x dx$$

$$= \int u^{10} du = \frac{1}{11} u^{11} + C$$

$$= \frac{1}{11} (\sin x)^{11} + C$$

$$\textcircled{4} \int_0^1 10x (5x^2 - 3)^6 dx = \int_{-3}^2 u^6 du = \frac{1}{7} u^7 \Big|_{-3}^2$$

$$u = 5x^2 - 3$$

$$\frac{du}{dx} = 10x$$

$$du = 10x dx$$

$$u(0) = -3$$

$$u(1) = 2$$

$$= \frac{1}{7} (2^7 - (-3)^7)$$

$$= \frac{2315}{7}$$