

Calculus Study Guide: section 4.9

Evaluate the integrals.

$$\int 8x^3 - \frac{4}{x} dx \quad \frac{8x^4}{4} - 4 \ln|x|$$

answer:  $2x^4 - 4 \ln|x| + C$

$$\int \sin(2x-2) dx$$

A)  $-\frac{1}{2} \cos(2x-2) + C$

B)  $\frac{1}{2} \cos(2x-2) + C$

C)  $-2 \cos(2x-2) + C$

D)  $2 \cos(2x-2) + C$

$$\int -\csc^2 x dx$$

A)  $\cos x + C$

B)  $\sec x + C$

C)  $\tan x + C$

D)  $\cot x + C$

E)  $\csc x + C$

$$\int e^{\frac{x}{2}-5} dx$$

answer:  $2e^{\frac{x}{2}-5} + C$

Solve the differential equation with the initial condition.

$$\frac{dy}{dx} = 3x^2 + \cos(x), \text{ with } y(0) = 12$$

$$y = x^3 + \sin x + C$$

$$12 = 0^3 + \sin 0 + C$$

$$C = 12$$

$$y = x^3 + \sin x + 12$$

$$\frac{dy}{dx} = \sec^2 x, \text{ with } y(\pi/4) = 2$$

$$y = \tan x + C$$

$$2 = \tan \pi/4 + C$$

$$2 = 1 + C$$

$$C = 1$$

$$y = \tan x + 1$$