Calc AB   9/16/15

Hw leader:
Lesson 38

Period 3   [Kira M.]   Period 4   [Sierra L.]

Integral of a Sum

★ Test 2 on Friday

[Lesson 38]

Recall: $\frac{d}{dx}(f(x) + g(x)) = \frac{d}{dx}(f(x)) + \frac{d}{dx}(g(x))$

Thus

$$\int (f(x) + g(x)) dx = \int f(x) dx + \int g(x) dx$$

Because

$\frac{d}{dx}\left[\int (f(x) + g(x)) dx\right] = f(x) + g(x)$ ✓

$\frac{d}{dx}\left[\int f(x) dx + \int g(x) dx\right] = \frac{d}{dx}\left[\int f(x) dx\right] + \frac{d}{dx}\left[\int g(x) dx\right] = f(x) + g(x)$ ✓

Ex. Evaluate $\int (2x + e^x + 3\cos(x)) dx$

$= \int 2x \, dx + \int e^x dx + \int 3\cos(x) dx$

$= 2\int x \, dx + \int e^x dx + 3\int \cos(x) dx$

$= \left(\frac{2x^2}{2} + C_1\right) + \left(e^x + C_2\right) + \left(3\sin(x) + C_3\right)$

$= x^2 + e^x + 3\sin(x) + C$ where $C = C_1 + C_2 + C_3$

Ex. 38.3 Integrate: $\int \left(\frac{7}{t} + 3t^{-1} + 4\cos(t) + 3\sin(t)\right) dt$

$= 7\ln|t| + 4\sin(t) - 3\cos(t) + C$