We want to show that $\int u(x) \cdot v'(x) dx = u(x) \cdot v(x) - \int u'(x)v(x) dx$. First, recall the product rule, which states that 

$$\frac{d}{dx} (u(x)v(x)) = u'(x)v(x) + u(x)v'(x).$$

Now, if we integrate both sides, we get 

$$\int \frac{d}{dx} (u(x)v(x)) \, dx = \int u'(x)v(x) \, dx + \int u(x)v'(x) \, dx.$$

Since the integral of the derivative of a function is the function itself, we know the left hand side is simply $u(x)v(x)$, i.e., 

$$u(x)v(x) = \int u'(x)v(x) \, dx + \int u(x)v'(x) \, dx.$$

Thus, subtract $\int u'(x)v(x) dx$ from both sides to get the desired result.