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Evaluate  $\int_0^1 x(x-1)^{14} dx$

**HINT:**

Use integration by parts:

$$\int f(x)g(x) dx = F(x)g(x) - \int F'(x)g'(x) dx + C, \text{ such that } F(x) = \int f(x) dx$$

Take  $f(x) = (x-1)^{14}$  and  $g(x) = x$

**Choosing  $g(x) = x$  reduces the degree to 0 after  $g'(x)$ , which prevents the repetitive use of integration by parts. Had we chosen  $g(x) = (x-1)^{14}$ , the degree would reduce to 13 however, the degree of  $F(x)$  would rise to 2 (because  $F(x) = \int f(x) dx$ ) which forces to reuse the integration by parts repetitively.**