$C = C_1 + C_2$

On C_1: $x = x, y = 0$ $\Rightarrow$ $dy = 0dx, 0 \le x \le 1$.

On C_2: $x = x, y = 2x - 2$ $\Rightarrow$ $dy = 2dx, 1 \le x \le 2$. Then

$$\int_C xy \, dx + (x - y) \, dy = \int_{C_1} xy \, dx + (x - y) \, dy + \int_{C_2} xy \, dx + (x - y) \, dy$$
$$= \int_0^1 (0 + 0)dx + \int_1^2 [(2x^2 - 2x) + (-x + 2)(2)]dx$$
$$= \int_1^2 (2x^2 - 4x + 4)dx = \frac{8}{3}$$