- $\int_0^1 \frac{x-4}{x^2-5x+6}\,dx$ [Hint: Partial fractions]

$$\frac{x-4}{(x-2)(x-3)} = \frac{A}{x-2} + \frac{B}{x-3}$$

$$\Rightarrow A(x-3) + B(x-2) = x-4$$

$x=2$: $-A = -2 \Rightarrow A = 2$

$x=3$: $B = -1$

$$\frac{x-4}{(x-2)(x-3)} = \frac{2}{x-2} - \frac{1}{x-3}$$

$$\int_0^1 \frac{x-4}{(x-2)(x-3)}\,dx = 2\int_0^1 \frac{1}{x-2}\,dx - \int_0^1 \frac{1}{x-3}\,dx$$

$$= 2\ln|x-2|\Big|_0^1 - \ln|x-3|\Big|_0^1$$

$$= (2\ln 1 - 2\ln 2) - (\ln 2 - \ln 3)$$

($\ln 1 = 0$)

$$= -3\ln 2 + \ln 3$$