No.

Date

$$\int \frac{x^3}{(x-1)^3(x-2)}\,dx$$

$$\frac{x^3}{(x-1)^3(x-2)} = \frac{A}{(x-1)^3} + \frac{B}{(x-1)^2} + \frac{C}{x-1} + \frac{D}{x-2} \quad \text{とおくと}$$

$$x^3 = A(x-2) + B(x-1)(x-2) + C(x-1)^2(x-2) + D(x-1)^3 \quad \cdots ①$$

$x=2$ 代入して　$\boxed{8 = D}$

$x=1$ 代入して　$1 = -A \rightarrow \boxed{A = -1}$

$x=3$ 代入して　$27 = -1\times 1 + B\times 2 + C\times 4 + 8\times 8$

$27 = -1 + 2B + 4C + 64$

$2B + 4C = 28 - 64 = -36$

$\boxed{B + 2C = -18}$

$x=0$ 代入して　$0 = -1\times(-2) + B\times(-1)(-2) + C\times 1\times(-2) + 8\times(-1)$

$0 = 2 + 2B - 2C - 8$

$0 = 1 + B - C - 4$

$0 = 1 - 18 - 2C - C - 4$

$3C = -21$

$\boxed{C = -7}$　　$\boxed{B} = -18 - 2C$

$= -18 - 2\times(-7) = -18 + 14 = \boxed{-4}$

よって (与式) $= \int \left(\frac{-1}{(x-1)^3} - \frac{4}{(x-1)^2} - \frac{7}{x-1} + \frac{8}{x-2} \right) dx$

$= -\frac{1}{2}\times\frac{-1}{(x-1)^2} + \frac{4}{(x-1)} - 7\log|x-1| + 8\log|x-2| + C$

$= \frac{1 + 8(x-1)}{2(x-1)^2} + \log\frac{(x-2)^8}{|x-1|^7} + C$

$= \boxed{\frac{8x-7}{2(x-1)^2} + \log\frac{(x-2)^8}{|x-1|^7} + C}$　(C は積分定数)