

$$1 \mid \int \frac{\sqrt{x-1}}{x} dx$$

Let $u = \sqrt{x-1}$, $du = \frac{1}{2\sqrt{x-1}} dx$

$$\int \frac{\sqrt{x-1}}{x} dx$$

$$2 \mid \int \tan^2 x + 1 dx$$

$$\begin{aligned} \int \tan^2 x + 1 dx &= \int \sec^2 x - 1 + 1 dx \\ &= \int \sec^2 x dx \end{aligned}$$

Let $u = x$, $du = 1$

$$\begin{aligned} &= \int \sec^2 u du \\ &= \tan u + C \\ &= \boxed{\tan x + C} \end{aligned}$$

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