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

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

$$\int \frac{\sqrt{x-1}}{x} dx = \int \frac{u}{TODO} dx$$

- 2 | 2
- 3 | 3
- 4 | 4
- 5 | 5
- $6 \mid \int \tan^2 x + 1 dx$

$$\int \tan^2 x + 1 dx = \int \sec^2 x - 1 + 1 dx$$
 
$$= \int \sec^2 x dx$$
 Let  $u = x, du = 1$ 

$$\begin{aligned} \det u &= x, du = 1 \\ &= \int \sec^2 u du \\ &= \tan u + C \\ &= \boxed{\tan x + C} \end{aligned}$$

- 7 | 7
- 8 | 8
- $9 \mid \int \frac{\sec^2 x}{\csc x} sinx dx$

$$\int \frac{\sec^2 x}{\csc x} \sin x dx = \int \tan^2 x dx$$
$$= \int \sec^2 x - 1 dx$$
$$= \int \sec^2 x dx - \int 1 dx$$
$$= \tan x - x$$

- 10 | 10
- 11 |  $\int \frac{e^{2\ln\sin x} + e^{2\ln\cos x}}{e^{2\ln\tan x} + e^{2\ln 1}} dx$

$$\int \frac{e^{2\ln\sin x} + e^{2\ln\cos x}}{e^{2\ln\tan x} + e^{2\ln 1}} dx = \int \frac{\sin^2 x + \cos^2 x}{\tan^2 x + 1} dx$$
$$= \int \frac{1}{\tan^2 x + 1} dx$$

- 12 | **12**
- 13 | **13**
- 14 | **14**