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

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

$$\int \frac{\sqrt{x-1}}{x} dx = \int \frac{u}{u^2+1} dx$$

2 | 2

3 | 3

4 | 4

5 | 5

6 | $\int \tan^2 x + 1 dx$

$$\int \tan^2 x + 1 dx = \int \sec^2 x - 1 + 1 dx$$
$$= \int \sec^2 x dx$$

Let $u = x, du = 1$

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

7 | 7

8 | 8

9 | $\int \frac{\sec^2 x}{\csc x} sinx dx$

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

10 | **10**

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

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

12 | **12**

13 | **13**

14 | **14**