

WS K&H

1) $y' = \pi x^{\pi-1}$

2) $y' = (1+\sqrt{2}) x^{\sqrt{2}}$

3) $y' = \sqrt{2} x^{-\sqrt{2}-1}$

4) $y' = (1-e) x^{-e}$

5) $y' = \ln 8 (8^x) (1)$

6) $y' = \ln 9 (9^{-x}) (-1)$

7) $y' = \ln 3 (3^{\csc x}) (-\csc x \cot x) (1)$

8) $y' = \ln 3 (3^{\cot x}) (-\csc^2 x) (1)$

9) $\ln y = \ln x (\ln x)$

$\frac{1}{y} \frac{dy}{dx} = 2 (\ln x)^{\frac{1}{x}} (1)$

$\frac{dy}{dx} = x^{\ln x} \left[2 \ln x \left(\frac{1}{x} \right) (1) \right]$

10) $y = (\ln x)^{\ln x}$

$y = 1 \rightarrow \frac{dy}{dx} = 0$
 $x \left(\frac{1}{x+1} \right) + \ln(x+1)$

11) $\frac{dy}{dx} = (x+1)^x$

12) $\frac{dy}{dx} = (x+2)^{(x+2)} \left[\ln(x+2) + 1 \right]$

13) $\frac{dy}{dx} = x^{\sin x} \left[\cos x \ln x + \sin x \frac{1}{x} \right]$

14) $\frac{dy}{dx} = (\sin x)^{\tan x} \left[\sec^2 x \sin x + \cot x \tan x \right]$

15) $y = \frac{\ln x^2}{\ln 4}$

$y' = \frac{2}{\ln 4} \frac{1}{x} (1)$

16) $y = \frac{1}{2 \ln 5} \ln x$

$y' = \frac{1}{2 \ln 5} \frac{1}{x} (1)$

17) $y = \frac{\ln(3x+1)}{\ln 2}$

$y' = \frac{1}{\ln 2} \frac{1}{(3x+1)} (3)$

18) $y = \frac{1}{\ln 10} \frac{1}{2} \ln(x+1)$

$y' = \frac{1}{2 \ln 10} \frac{1}{(x+1)} (1)$

19) $y = \frac{\ln x^{-1}}{\ln 2}$

$y' = -\frac{1}{\ln 2} \frac{1}{x} (1)$

20) $y = (\log_2 x)^{-1}$

$y = \frac{(\ln x)^{-1}}{(\ln 2)^{-1}}$

$y = \ln 2 (\ln x)^{-1}$

$y' = -\ln 2 (\ln x)^{-2} \left(\frac{1}{x} \right) (1)$





$$21.) y = \frac{\ln 2}{\ln 2} \ln x$$

$$y' = \frac{1}{x} (1)$$

$$22.) y = \frac{\ln(1+x \ln 3)}{\ln 3}$$

$$y' = \frac{1}{\ln 3} \frac{1}{1+x \ln 3} (\ln 3)$$

$$23.) y = \frac{\ln e^x}{\ln 10} = \frac{x}{\ln 10}$$

$$y' = \frac{1}{\ln 10}$$

$$24.) y = \ln 10^x$$

$$y' = \frac{1}{10^x} (\ln 10) (10^x) (1)$$

$$25.) 3 \int x^{\sqrt{3}} = \frac{3 x^{\sqrt{3}+1}}{\sqrt{3}+1} + C$$

$$26.) \int x^{\sqrt{2}} dx = \frac{x^{\sqrt{2}+1}}{\sqrt{2}+1} + C$$

$$27.) \frac{1}{\ln 5} 5^x + C$$

$$28.) \frac{x \ln 2}{\ln 2} + C$$

$$29.) \int 2^{-x} dx = -\frac{1}{\ln 2} 2^{-x} + C$$

$u = -x$
 $-du = dx$

$$30.) \int 2^{x+1} dx = \frac{1}{\ln 2} 2^{x+1} + C$$

$v = x+1$
 $dv = dx$

$$31.) \int 4^{-x} \ln 2 dx$$

$v = -x$
 $-dv = dx$

$$-\ln 2 \int 4^v dv$$

$$-\ln 2 \left(\frac{1}{\ln 4} \right) 4^{-x} + C$$

$$32.) -\frac{1}{\ln 5} 5^{-x} + C$$

$$33.) \int x 2^{x^2} dx$$

$v = x^2$
 $dv = 2x dx$

$$\frac{1}{2} \int 2^v dv = \frac{1}{2 \ln 2} 2^v + C$$

$$34.) \int 2^{\cos x} \sin x dx$$

$u = \cos x$

$du = -\sin x dx$

$$-\int 2^u du = -\frac{1}{\ln 2} (2^{\cos x}) + C$$

$$35.) \frac{1}{\ln 10} \int \frac{\ln x}{x} dx$$

$u = \ln x$

$du = \frac{1}{x} dx$

$\frac{1}{\ln 10} \int u du$

$$\frac{1}{2 \ln 10} (\ln x)^2 + C$$



$$36) \frac{1}{\ln 2} \int \frac{\ln x}{x} dx \quad \frac{1}{2 \ln 2} (\ln x)^2 + c$$

$$37) \frac{1}{\ln 2} \int \frac{\ln(x+2)}{x+2} dx$$

$$v = \ln(x+2)$$

$$dv = \frac{1}{x+2} (1) dx$$

$$\frac{1}{\ln 2} \int u dv$$

$$\frac{1}{2 \ln 2} (\ln(x+2))^2 + c$$

$$38) \frac{1}{\ln 10} \int \frac{\ln 10x}{x} dx$$

$$v = \ln 10x$$

$$dv = \frac{1}{10x} \cdot 10 dx$$

$$\frac{1}{\ln 10} \int u dv$$

$$= \frac{1}{2 \ln 10} (\ln 10x)^2 + c$$

$$39) \frac{2}{\ln 10} \int \frac{\ln x+1}{x+1} dx$$

$$v = \ln(x+1)$$

$$dv = \left(\frac{1}{x+1}\right) dx$$

$$\frac{2}{\ln 10} \int u dv = \frac{1}{\ln 10} (\ln(x+1))^2 + c$$

40)

$$41) \int \frac{3^{\sqrt{x}}}{\sqrt{x}} dx$$

$$v = \sqrt{x}$$

$$dv = \frac{1}{2\sqrt{x}} dx$$

$$2dv = \frac{1}{\sqrt{x}} dx$$

$$2 \int 3^v dv$$

$$2 \frac{1}{\ln 3} 3^{\sqrt{x}} + c$$