

23.  $y = \sqrt{1 + 2e^{3x}}$

25.  $y = 5^{-1/x}$

27.  $y = \frac{r}{\sqrt{r^2 + 1}}$

29.  $F(t) = e^{t \sin 2t}$

31.  $y = \sin(\tan 2x)$

(23)  $y = (1 + 2e^{3x})^{1/2}$

$y' = \frac{1}{2} (1 + 2e^{3x})^{-1/2} \cdot 2e^{3x} \cdot 3$   
 $= \frac{6e^{3x}}{2\sqrt{1 + 2e^{3x}}} = \frac{3e^{3x}}{\sqrt{1 + 2e^{3x}}}$

(25)  $y' = 5^{-1/x} \cdot \ln 5 \cdot \frac{1}{x^2}$

(27)  $y' = \frac{(\sqrt{r^2+1})'(1) - (r)(\frac{1}{2}(r^2+1)^{-1/2} \cdot 2r)}{r^2+1}$

(29)  $F'(t) = e^{t \sin 2t} \cdot [(\sin 2t)(1) + (t)(\cos 2t \cdot 2)]$

(31)  $y' = \cos(\tan 2x) \cdot \sec^2 2x \cdot 2$

3.  $f(x) = \sin(\ln x)$

5.  $f(x) = \ln \frac{1}{x}$

7.  $f(x) = \log_{10}(x^3 + 1)$

9.  $f(x) = \sin x \ln(5x)$

11.  $g(x) = \ln(x\sqrt{x^2 - 1})$

13.  $G(y) = \ln \frac{(2y+1)^5}{\sqrt{y^2+1}}$

15.  $F(s) = \ln \ln s$

17.  $y = \tan[\ln(ax + b)]$

19.  $y = \ln(e^{-x} + xe^{-x})$

(3)  $f'(x) = \cos(\ln x) \cdot \frac{1}{x}$

(5)  $f'(x) = \frac{1}{(1/x)} \cdot \frac{-1}{x^2} = \frac{-x}{x^2} = -\frac{1}{x}$

(7) OMIT

(9)  $f'(x) = (\ln 5x)(\cos x) + (\sin x) \left(\frac{1}{5x} \cdot 5\right)$

(11)  $g(x) = \ln x + \ln \sqrt{x^2 - 1}$

$g'(x) = \frac{1}{x} + \frac{1}{\sqrt{x^2 - 1}} \cdot \frac{1}{2} (x^2 - 1)^{-1/2} \cdot 2x$   
 $= \frac{1}{x} + \frac{x}{x^2 - 1}$

(13)  $G(y) = 5 \ln(2y+1) - \frac{1}{2} \ln(y^2+1)$

$G'(y) = 5 \cdot \frac{1}{2y+1} \cdot 2 - \frac{1}{2} \cdot \frac{1}{y^2+1} \cdot 2y = \frac{10}{2y+1} - \frac{y}{y^2+1}$

(15)  $F' = \frac{1}{\ln s} \cdot \frac{1}{s} = \frac{1}{s \ln s}$

(17)  $y' = \sec^2(\ln(ax+b)) \cdot \frac{1}{ax+b} \cdot a = \frac{a \sec^2(\ln(ax+b))}{ax+b}$

(19)  $y' = \frac{1}{e^{-x} + xe^{-x}} \cdot (-e^{-x} + (e^{-x})(1) + (x)(-e^{-x}))$