SOL- ASSIGN -3-

\# 14-3.5 $\tan(x-y) = \frac{y}{1+x^2} \Rightarrow (1+x^2)\tan(x-y) = y$

$$\Rightarrow 2x\cdot\tan(x-y) + (1+x^2)\cdot\frac{1}{\cos^2(x-y)}(1-y') = y'$$

$$\Rightarrow 2x\cdot\tan(x-y) + \frac{1+x^2}{\cos^2(x-y)} = y'\left\{1+\frac{1+x^2}{\cos^2(x-y)}\right\}$$

$$\Rightarrow y' = \frac{2x\cdot\tan(x-y) + \frac{1+x^2}{\cos^2(x-y)}}{1+\frac{1+x^2}{\cos^2(x-y)}}$$

\# 24 - 3 6 By C.Rule one gets:

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

$$= \frac{1}{2+2x^2-2x\sqrt{1+x^2}}\left(1-\frac{x}{\sqrt{1+x^2}}\right)$$

\# 18 -3.7 By C.Rule one gets:

$y' = 2\cdot\left(\ln(1+e^x)\right)\cdot\frac{e^x}{1+e^x}$. We used $\left(\ln(1+e^x)\right)' = \frac{e^x}{1+e^x}$.

#36 – 3.7 USE $\ln \Rightarrow$ $\ln y = \ln\left(\sqrt[4]{\frac{x^2+1}{x^2-1}}\right) =$

$= \frac{1}{4}\left(\ln(x^2+1) - \ln(x^2-1)\right) \Rightarrow$ (by im. Diff.)

$$\frac{y'}{y} = \frac{1}{4}\left\{\frac{2x}{x^2+1} - \frac{2x}{x^2-1}\right\} \Rightarrow$$

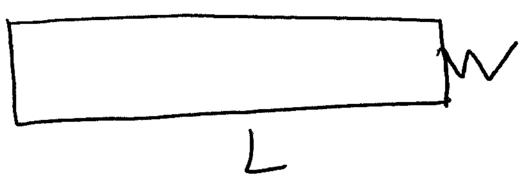
$$y' = \sqrt[4]{\frac{x^2+1}{x^2-1}} \cdot \frac{1}{4} \cdot \left\{\frac{2x}{x^2+1} - \frac{2x}{x^2-1}\right\}.$$

#14 – 3.9 $f(x) = e^x$; $a = 0$ $\Rightarrow f'(x) = e^x$;

$f'(a) = f'(0) = 1$. So $f(x) = e^x \approx f(a) + f'(a)\cdot$

$\cdot(x-a) = e^0 + 1(x-0) = \underline{\underline{1 + x}}$

#4 – 4.1



$L' = \frac{dL}{dt} = 8$

$W' = \frac{dW}{dt} = 3$

$A = L \cdot W \Rightarrow A' = L' \cdot W + L \cdot W' = 8W + 3L$

At that time: $A' = 8 \cdot 10 + 3 \cdot 20 =$

$= 80 + 60 = 140 \ \frac{cm}{s}$

\# 52 $-4.2.$ $f(0) = 0 - 2\cdot \tan^{-1}(0) = \boxed{0}$

$f(4) = 4 - 2\tan^{-1}(4) = 4 - 2(1.3258)$

$= \boxed{+1.348}$

$f'(x) = 1 - \frac{2}{1+x^2} = \frac{x^2-1}{x^2+1}$

$f'(x) = 0 \Rightarrow x = \pm 1$. Only: 1 is in $[0,4]$

$f(1) = 1 - 2\tan^{-1}(1) = 1 - \frac{\pi}{2} = \boxed{-0.57}$

ABS MAX value is $f(4) = 1.348$

ABS MIN VALUE is $f(1) = -0.57$