27.3

(3) $y = \sin^{-1} 7x$

$$y' = \frac{1}{\sqrt{1-(7x)^2}} \quad (7)$$

$$= \frac{7}{\sqrt{1-49x^2}}$$

(7) $y = 3.6 \cos^{-1} 0.5s$

$$y' = 3.6 \left[\frac{-1}{\sqrt{1-(0.5s)^2}} (0.5) \right]$$

$$= \frac{-1.8}{\sqrt{1-0.25s^2}}$$

(11) $v = 8 \tan^{-1} \sqrt{s}$

$$v' = 8 \frac{1}{1+\sqrt{s}^2} \left(\frac{1}{2} s^{-1/2}\right)$$

$$= \frac{4}{\sqrt{s}(1+s)}$$

(23) $y = 2(\cos^{-1} 4x)^3$

$$y' = 6(\cos^{-1} 4x)^2 \left[\frac{-1}{\sqrt{1-(4x)^2}} (4)\right]$$

$$= \frac{-24(\cos^{-1} 4x)^2}{\sqrt{1-16x^2}}$$

(41) $y = x \tan^{-1} x$

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

$$y' = \frac{x}{1+x^2} + \tan^{-1} x$$

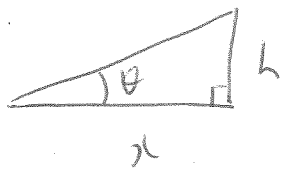
$$y'' = \frac{(1+x^2)(1) - x(2x)}{(1+x^2)^2} + \frac{1}{1+x^2}$$

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

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

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

(53)



(h is constant)

$$\theta = \tan^{-1}\frac{h}{x}$$

$$\frac{d\theta}{dx} = \frac{1}{1+\left(\frac{h}{x}\right)^2}\ \frac{d}{dx}\left[h x^{-1}\right]$$

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

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

$$= \frac{-h}{x^2+h^2}$$