

Sec 3.6 page 220 (17-20, 21-27 odd)

$$\begin{aligned} (17) \quad y &= (\tan^{-1} x)^2 \\ u^2 & \quad u = \tan^{-1} x \\ 2u & \quad u' = \frac{1}{1+x^2} \\ 2(\tan^{-1} x) & \end{aligned}$$

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

$$\begin{aligned} (18) \quad y &= \tan^{-1}(x^2) \\ \tan^{-1} u & \quad u = x^2 \\ \frac{1}{1+u^2} & \quad u' = 2x \\ \frac{1}{1+x^4} & \end{aligned}$$

$$y' = \frac{2x}{1+x^4}$$

$$\begin{aligned} (19) \quad y &= \sin^{-1}(2x+1) \\ \sin^{-1} u & \quad u = 2x+1 \\ \frac{1}{\sqrt{1-u^2}} & \quad u' = 2 \\ \frac{1}{\sqrt{1-(2x+1)^2}} & = \frac{1}{\sqrt{-4x^2-4x}} \end{aligned}$$

$$y' = \frac{2}{\sqrt{-4x^2-4x}} = \frac{1}{\sqrt{-x^2-x}}$$

$$\begin{aligned} (20) \quad F(\theta) &= \arcsin \sqrt{\sin \theta} \\ \arcsin u & \quad u = \sqrt{\sin \theta} \\ \frac{1}{\sqrt{1-u^2}} & \quad u' = \frac{\cos \theta}{2\sqrt{\sin \theta}} \\ \frac{1}{\sqrt{1-\sin \theta}} & \end{aligned}$$

$$F'(\theta) = \frac{\cos \theta}{2\sqrt{1-\sin \theta}(\sqrt{\sin \theta})}$$

$$\begin{aligned} (21) \quad G(x) &= \sqrt{1-x^2} \arccos x \\ &= \frac{-2x}{2\sqrt{1-x^2}} (\arccos x) + \frac{\sqrt{1-x^2}}{-\sqrt{1-x^2}} \\ &= \frac{-x \arccos x - 1}{\sqrt{1-x^2}} \end{aligned}$$

$$\begin{aligned} (23) \quad y &= \cos^{-1}(e^{2x}) \\ \cos^{-1} u & \quad u = e^{2x} \\ 1 & \quad u' = 2e^{2x} \\ -\frac{1}{\sqrt{1-e^{4x}}} & \end{aligned} \quad \boxed{y' = \frac{-2e^{2x}}{\sqrt{1-e^{4x}}}}$$

$$\begin{aligned} (25) \quad y &= \arctan(\cos \theta) \\ \arctan u & \quad u = \cos \theta \\ 1 & \quad u' = -\sin \theta \\ \frac{1}{1+\cos^2 \theta} & \end{aligned} \quad \boxed{y' = \frac{-\sin \theta}{1+\cos^2 \theta}}$$

$$\begin{aligned} (27) \quad y &= x \sin^{-1} x + \sqrt{1-x^2} \\ \sin^{-1} x + \frac{x}{\sqrt{1-x^2}} & \quad = \frac{2x}{2\sqrt{1-x^2}} \\ \boxed{y' = \sin^{-1} x} & \end{aligned}$$