




3.9 (2, 4, 10, 12, 14, 16, 18, 20, 22, 24, 26, 34, 52, 54)


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② a) $\tan^{-1}(-1) = -\frac{\pi}{4}$ 

b) $\tan^{-1}(\sqrt{3}) = \frac{\pi}{3}$ 

c) $\tan^{-1}\left(\frac{-1}{\sqrt{3}}\right) = -\frac{\pi}{6}$ 

④ a) $\sin^{-1}\left(\frac{1}{2}\right) = \frac{\pi}{6}$ 

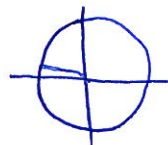
b) $\sin^{-1}\left(-\frac{1}{2}\right) = -\frac{\pi}{6}$ 

c) $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = \frac{\pi}{3}$ 

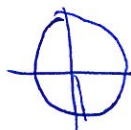
⑩ $\sec(\cos^{-1}\left(\frac{1}{2}\right)) = \sec\left(\frac{\pi}{3}\right) = 2$

⑫ $\cot\left(\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)\right) = \cot\left(-\frac{\pi}{3}\right) = \frac{\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}}$

⑭ $\lim_{x \rightarrow -1^+} \cos^{-1} x = -\pi$



⑮ $\lim_{x \rightarrow -\infty} \tan^{-1} x = -\frac{\pi}{2}$



⑰ $\lim_{x \rightarrow \infty} \sec^{-1} x = \frac{\pi}{2}$



⑳ $\lim_{x \rightarrow -\infty} \csc^{-1} x = 0$



22) $y = \cos^{-1}(x^{-1})$
 $\frac{dy}{dx} = \frac{-1}{\sqrt{1-x^{-2}}} \cdot (-x^{-2}) = \frac{1}{x^2\sqrt{1-x^{-2}}}$

24) $y = \sin^{-1}(1-t)$
 $\frac{dy}{dt} = \frac{1}{\sqrt{1-(1-t)^2}} \cdot (-1) = \frac{-1}{\sqrt{1-1+2t-t^2}} = \frac{-1}{\sqrt{2t-t^2}}$

26) $y = \sec^{-1}(5s)$
 $\frac{dy}{ds} = \frac{1}{|5s|\sqrt{(5s)^2-1}} \cdot 5 = \frac{1}{|s|\sqrt{25s^2-1}}$

34) $y = \tan^{-1}(\ln x)$
 $\frac{dy}{dx} = \frac{1}{1+(\ln x)^2} \cdot \frac{1}{x}$

52) $\tan y = x$
 $\sec^2 y \frac{dy}{dx} = 1$
 $(x^2+1) \frac{dy}{dx} = 1$
 $\frac{dy}{dx} = \frac{1}{1+x^2}$

$\frac{\sin^2 y}{\cos^2 y} + \frac{\cos^2 y}{\cos^2 y} = \frac{1}{\cos^2 y}$
 $x^2+1 = \tan^2 y + 1 = \sec^2 y$

54) $\cot^{-1} u = \frac{\pi}{2} - \tan^{-1} u$
 $\frac{d}{dx}(\cot^{-1} u) = \frac{d}{dx}(\frac{\pi}{2} - \tan^{-1} u)$
 $= -\frac{1}{1+u^2} \frac{du}{dx}$