7.8: 8 $\cosh 3x - \sinh 3x = \frac{e^{3x}+e^{-3x}}{2} - \frac{e^{3x}-e^{-3x}}{2} = e^{-3x}$

7.8: 10 $\ln(\cosh x + \sinh x) + \ln(\cosh x - \sinh x) = \ln(\cosh^2 x - \sinh^2 x) = \ln 1 = 0$

7.8: 14 $y = \frac{1}{2}\sinh(2x+1) \Rightarrow \frac{dy}{dx} = \frac{1}{2}[\cosh(2x+1)](2) = \cosh(2x+1)$

7.8: 26 $y = \cosh^{-1} 2\sqrt{x+1} = \cosh^{-1}(2(x+1)^{1/2}) \Rightarrow \frac{dy}{dx} = \frac{(2)(\frac{1}{2})(x+1)^{-1/2}}{\sqrt{[2(x+1)^{1/2}]^2-1}} = \frac{1}{\sqrt{x+1}\sqrt{4x+3}} = \frac{1}{4x^2+7x+3}$

8.1: 4 $\int \cot^3 y \csc^2 y dy; \begin{bmatrix} u = \cot y \\ du = -\csc^2 y dy \end{bmatrix} \to \int u^3(-du) = -\frac{u^4}{4} + C = \frac{-\cot^4 y}{4} + C$

8.1: 42 $\int \frac{dx}{(x-2)\sqrt{x^2-4x+3}} = \int \frac{dx}{(x-2)\sqrt{(x-2)^2-2}}; \begin{bmatrix} u = x-2 \\ du = dx \end{bmatrix} \to \int \frac{du}{u\sqrt{u^2-1}} = \sec^{-1}|u| + C = \sec^{-1}|x-2| + C, |u| = |x-2| > 1$

8.1: 52 $\int \frac{2\theta^3-7\theta^2+7\theta}{2\theta-5} = \int[(\theta^2-\theta+1) + \frac{5}{2\theta-5}]d\theta = \frac{\theta^3}{3} - \frac{\theta^2}{2} + \theta + \frac{5}{2}\ln|2\theta-5| + C$

8.1: 62 $\int \frac{1}{1-\csc x}dx = \int \frac{\sin x}{\sin x - 1}dx = \int \left(1 + \frac{1}{\sin x - 1}\right)dx = \int \left(1 + \frac{\sin x + 1}{(\sin x-1)(\sin x+1)}\right)dx = \int \left(1 - \frac{1+\sin x}{\cos^2 x}\right)dx = \int \left(1 - \sec^2 x - \frac{\sin x}{\cos^2 x}\right)dx = \int(1 - \sec^2 x - \sec x \tan x)dx = x - \tan x - \sec x + C$

8.1: 66 $\int_{-\pi}^{0} \sqrt{1+\cos t}dt = \int_{-\pi}^{0} \sqrt{2}\left|\cos\frac{t}{2}\right| dt; \begin{bmatrix} \cos\frac{t}{2} \geq 0 \\ \text{for } -\pi \leq t \leq \pi \end{bmatrix} \to \int_{-\pi}^{0} \sqrt{2}\cos\frac{t}{2}dt = [2\sqrt{2}\sin\frac{t}{2}]_{-\pi}^{0} = 2\sqrt{2}[\sin 0 - \sin(-\frac{\pi}{2})] = 2\sqrt{2}$