3.8 Even Answers

2. $\dfrac{1}{|x|\sqrt{x^2-1}}$

4. $-\dfrac{1}{\sqrt{2t-t^2}}$

6. $\dfrac{1}{|s|\sqrt{25s^2-1}}$

8. $-\dfrac{2}{|x|\sqrt{x^2-4}}$

10. $-\dfrac{6}{t\sqrt{t^4-9}}$

12. $-\dfrac{1}{2t\sqrt{t-1}}$

14. $\dfrac{s|s|-1}{|s|\sqrt{s^2-1}}$

20. (a) $f(1) = 3 \quad f'(1) = 12$

(b) $f^{-1}(3) = 1 \qquad \left(f^{-1}\right)'(3) = \dfrac{1}{12}$

(c) $f^{-1}(1) = 0 \qquad \left(f^{-1}\right)'(1) = \dfrac{1}{3}$

22. (a) all reals

(b) $\left[-\dfrac{\pi}{2}, \dfrac{\pi}{2}\right]$

(c) at the points $x = k\dfrac{\pi}{2}$ where k is an odd integer

(e) $f'(x) = \dfrac{\cos x}{\sqrt{1-\sin^2 x}}$ which is ± 1 depending upon whether cos x is positive or negative

3.9 Even Answers

2. $\dfrac{dy}{dx} = 2e^{2x}$

4. $\dfrac{dy}{dx} = -5e^{-5x}$

6. $\dfrac{dy}{dx} = -\dfrac{1}{4}e^{-x/4}$

8. $\dfrac{dy}{dx} = x^2e^x + xe^x - e^x$

10. $\dfrac{dy}{dx} = 2xe^{x^2}$

12. $\dfrac{dy}{dx} = (1+\sqrt{2})x^{\sqrt{2}}$

14. $\dfrac{dy}{dx} = (1-e)x^{-e}$

16. $\dfrac{dy}{dx} = -9^{-x}\ln 9$

18. $\dfrac{dy}{dx} = -3^{\cot x}(\ln 3)\csc^2 x$

20. $\dfrac{dy}{dx} = 0 \quad x > 0$

22. $\dfrac{dy}{dx} = \dfrac{2\ln x}{x}$

24. $\dfrac{dy}{dx} = -\dfrac{1}{x} \quad x > 0$

26. $\dfrac{dy}{dx} = \dfrac{1}{x+1} \quad x > -1$

28. $\dfrac{dy}{dx} = \dfrac{2x}{x^2+1}$

30. $\dfrac{dy}{dx} = \ln x$

32. $\dfrac{dy}{dx} = \dfrac{1}{2x\ln 5} \quad x > 0$

44. $\dfrac{dy}{dx} = x^{\tan x}\left[\dfrac{\tan x}{x} + (\ln x)(\sec^2 x)\right]$