**7.** $f(x) = 5x^{1/4} - 7x^{3/4} \quad \Rightarrow \quad F(x) = 5\dfrac{x^{1/4+1}}{\frac{1}{4}+1} - 7\dfrac{x^{3/4+1}}{\frac{3}{4}+1} + C = 5\dfrac{x^{5/4}}{5/4} - 7\dfrac{x^{7/4}}{7/4} + C = 4x^{5/4} - 4x^{7/4} + C$

**8.** $f(x) = 2x + 3x^{1.7} \quad \Rightarrow \quad F(x) = x^2 + \frac{3}{2.7}x^{2.7} + C = x^2 + \frac{10}{9}x^{2.7} + C$

**9.** $f(x) = 6\sqrt{x} - \sqrt[6]{x} = 6x^{1/2} - x^{1/6} \quad \Rightarrow$

$F(x) = 6\dfrac{x^{1/2+1}}{\frac{1}{2}+1} - \dfrac{x^{1/6+1}}{\frac{1}{6}+1} + C = 6\dfrac{x^{3/2}}{3/2} - \dfrac{x^{7/6}}{7/6} + C = 4x^{3/2} - \frac{6}{7}x^{7/6} + C$

**10.** $f(x) = \sqrt[4]{x^3} + \sqrt[3]{x^4} = x^{3/4} + x^{4/3} \quad \Rightarrow \quad F(x) = \dfrac{x^{7/4}}{7/4} + \dfrac{x^{7/3}}{7/3} + C = \frac{4}{7}x^{7/4} + \frac{3}{7}x^{7/3} + C$

**14.** $f(x) = 3e^x + 7\sec^2 x \quad \Rightarrow \quad F(x) = 3e^x + 7\tan x + C_n$ on the interval $\left(n\pi - \frac{\pi}{2}, n\pi + \frac{\pi}{2}\right)$.

**15.** $g(\theta) = \cos\theta - 5\sin\theta \quad \Rightarrow \quad G(\theta) = \sin\theta - 5(-\cos\theta) + C = \sin\theta + 5\cos\theta + C$

**35.** $f'(x) = x^{-1/3}$ has domain $(-\infty, 0) \cup (0, \infty) \quad \Rightarrow \quad f(x) = \begin{cases} \frac{3}{2}x^{2/3} + C_1 & \text{if } x > 0 \\ \frac{3}{2}x^{2/3} + C_2 & \text{if } x < 0 \end{cases}$

$f(1) = \frac{3}{2} + C_1$ and $f(1) = 1 \quad \Rightarrow \quad C_1 = -\frac{1}{2}$. $f(-1) = \frac{3}{2} + C_2$ and $f(-1) = -1 \quad \Rightarrow \quad C_2 = -\frac{5}{2}$.

Thus, $f(x) = \begin{cases} \frac{3}{2}x^{2/3} - \frac{1}{2} & \text{if } x > 0 \\ \frac{3}{2}x^{2/3} - \frac{5}{2} & \text{if } x < 0 \end{cases}$

**36.** $f'(x) = 4/\sqrt{1-x^2} \quad \Rightarrow \quad f(x) = 4\sin^{-1}x + C$. $f\left(\frac{1}{2}\right) = 4\sin^{-1}\left(\frac{1}{2}\right) + C = 4 \cdot \frac{\pi}{6} + C$ and $f\left(\frac{1}{2}\right) = 1 \quad \Rightarrow$

$\frac{2\pi}{3} + C = 1 \quad \Rightarrow \quad C = 1 - \frac{2\pi}{3}$, so $f(x) = 4\sin^{-1}x + 1 - \frac{2\pi}{3}$.

**46.** $f'''(x) = \cos x \quad \Rightarrow \quad f''(x) = \sin x + C$. $f''(0) = C$ and $f''(0) = 3 \quad \Rightarrow \quad C = 3$. $f''(x) = \sin x + 3 \quad \Rightarrow$

$f'(x) = -\cos x + 3x + D$. $f'(0) = -1 + D$ and $f'(0) = 2 \quad \Rightarrow \quad D = 3$. $f'(x) = -\cos x + 3x + 3 \quad \Rightarrow$

$f(x) = -\sin x + \frac{3}{2}x^2 + 3x + E$. $f(0) = E$ and $f(0) = 1 \quad \Rightarrow \quad E = 1$. Thus, $f(x) = -\sin x + \frac{3}{2}x^2 + 3x + 1$.

**57.** $v(t) = s'(t) = \sin t - \cos t \quad \Rightarrow \quad s(t) = -\cos t - \sin t + C$. $s(0) = -1 + C$ and $s(0) = 0 \quad \Rightarrow \quad C = 1$, so

$s(t) = -\cos t - \sin t + 1$.

**60.** $a(t) = v'(t) = \cos t + \sin t \quad \Rightarrow \quad v(t) = \sin t - \cos t + C \quad \Rightarrow \quad 5 = v(0) = -1 + C \quad \Rightarrow \quad C = 6$, so

$v(t) = \sin t - \cos t + 6 \quad \Rightarrow \quad s(t) = -\cos t - \sin t + 6t + D \quad \Rightarrow \quad 0 = s(0) = -1 + D \quad \Rightarrow \quad D = 1$, so

$s(t) = -\cos t - \sin t + 6t + 1$.