10. $y = \dfrac{1 - \sec x}{\tan x} \quad \Rightarrow$

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

12. $y = \csc\theta\,(\theta + \cot\theta) \quad \Rightarrow$

$$\begin{aligned} y' &= \csc\theta\,(1 - \csc^2\theta) + (\theta + \cot\theta)(-\csc\theta\cot\theta) = \csc\theta\,(1 - \csc^2\theta - \theta\cot\theta - \cot^2\theta) \\ &= \csc\theta\,(-\cot^2\theta - \theta\cot\theta - \cot^2\theta) \qquad \left[1 + \cot^2\theta = \csc^2\theta\right] \\ &= \csc\theta\,(-\theta\cot\theta - 2\cot^2\theta) = -\csc\theta\cot\theta\,(\theta + 2\cot\theta) \end{aligned}$$

29. $f(x) = x - 2\sin x$, $0 \le x \le 2\pi$. $f'(x) = 1 - 2\cos x$. So $f'(x) > 0 \quad \Leftrightarrow \quad 1 - 2\cos x > 0 \quad \Leftrightarrow \quad -2\cos x > -1 \quad \Leftrightarrow$ $\cos x < \frac{1}{2} \quad \Leftrightarrow \quad \frac{\pi}{3} < x < \frac{5\pi}{3} \quad \Rightarrow \quad f$ is increasing on $\left(\frac{\pi}{3}, \frac{5\pi}{3}\right)$.

30. $f(x) = x - \sin x$, $0 \le x \le 2\pi$. $f'(x) = 1 - \cos x \quad \Rightarrow \quad f''(x) = \sin x$. Since $\sin x > 0$ on $(0, \pi)$, f is concave upward on $(0, \pi)$.