Section 1.3 #140: Simplify the expresison by writing it in terms of sines and cosines, then simplify: $\sec(x)\sin(x)\cot(x)$.

Solution: We know $\sec(x) = \dfrac{1}{\cos(x)}$ and $\cot(x) = \dfrac{\cos(x)}{\sin(x)}$. Plugging these in yields

$$\begin{aligned} \sec(x)\sin(x)\cot(x) &= \left(\frac{1}{\cos(x)}\right)\sin(x)\left(\frac{\cos(x)}{\sin(x)}\right) \\ &= \left(\frac{1}{\cancel{\cos(x)}}\right)\cancel{\sin(x)}\left(\frac{\cancel{\cos(x)}}{\cancel{\sin(x)}}\right) \\ &= 1. \end{aligned}$$

Section 1.3 #156: Solve the trigonometric equation on the interval $0 \le \theta < 2\pi$: $1 + \cos(\theta) = \dfrac{1}{2}$.

Solution: First isolate $\cos(\theta)$ here by subtracting 1 on both sides to get the equation $\cos(\theta) = -\dfrac{1}{2}$. To solve this means to look at the unit circle and find the angle θ that yields a point on the circle whose x-coordinate is $-\dfrac{1}{2}$. These are the points $\theta = \dfrac{2\pi}{3}$ and $\theta = \dfrac{4\pi}{3}$.