Solve the equation $\sqrt{3\csc x} - 2 = 0$.

Solution.

$$\sqrt{3\csc(x)} - 2 = 0 \Rightarrow \sqrt{3\csc(x)} = 2 \Rightarrow 3\csc(x) = 4 \Rightarrow \csc(x) = \frac{4}{3} \Rightarrow \sin x = \frac{3}{4} \Rightarrow$$

$$\Rightarrow \begin{bmatrix} x = \arcsin\left(\frac{3}{4}\right) + 2\pi k, k \in \mathbb{Z} \\ x = \pi - \arcsin\left(\frac{3}{4}\right) + 2\pi k, k \in \mathbb{Z} \end{bmatrix}.$$

Answer.

$\cup_{k\in\mathbb{Z}} \left\{\arcsin\left(\frac{3}{4}\right) + 2\pi k,\ \pi - \arcsin\left(\frac{3}{4}\right) + 2\pi k\right\}$.