

**Exercise 157**

For the following exercises, solve the trigonometric equations on the interval  $0 \leq \theta < 2\pi$ .

$$2 \tan^2 \theta = 2$$

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**Solution**

$$2 \tan^2 \theta = 2$$

$$\tan^2 \theta = 1$$

$$\tan^2 \theta - 1 = 0$$

$$(\tan \theta + 1)(\tan \theta - 1) = 0$$

$$\tan \theta + 1 = 0 \quad \text{or} \quad \tan \theta - 1 = 0$$

$$\tan \theta = -1 \quad \text{or} \quad \tan \theta = 1$$

Therefore,

$$\theta = \left\{ \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4} \right\}.$$