

F.TF.B.7: Trigonometric Equations 4

- 1 In the interval $90^\circ < x < 270^\circ$, what is the solution of the equation $\csc x = -2$?
 - 1) 120°
 - 2) 150°
 - 3) 210°
 - 4) 240°

- 2 What is the solution set of the equation $-\sqrt{2} \sec x = 2$ when $0^\circ \leq x < 360^\circ$?
 - 1) $\{45^\circ, 135^\circ, 225^\circ, 315^\circ\}$
 - 2) $\{45^\circ, 315^\circ\}$
 - 3) $\{135^\circ, 225^\circ\}$
 - 4) $\{225^\circ, 315^\circ\}$

- 3 Solve $\sec x - \sqrt{2} = 0$ algebraically for all values of x in $0^\circ \leq x < 360^\circ$.

- 4 Find, algebraically, the measure of the obtuse angle, to the *nearest degree*, that satisfies the equation $5 \csc \theta = 8$.

- 5 What is one possible value of θ in the equation $\cot \theta = \cos \theta$?
 - 1) 0°
 - 2) 45°
 - 3) 90°
 - 4) 180°

- 6 Find all values of θ in the interval $0^\circ \leq \theta < 360^\circ$ which satisfy the equation $2 \sin \theta - 1 = \csc \theta$.

- 7 In the interval $0^\circ \leq \theta < 360^\circ$, find all values of θ that satisfy the equation $1 + 2 \sin \theta = \csc \theta$.

- 8 Find all values of θ in the interval $0^\circ \leq \theta < 360^\circ$ which satisfy the equation $2 \cos \theta + 1 = \sec \theta$.

- 9 Find a positive acute angle θ such that $4 \cot \theta \sin \theta = 2$.

- 10 Find, to the *nearest degree*, all values of θ in the interval $0^\circ \leq \theta < 360^\circ$ which satisfy the equation $2 \sin \theta - 3 \csc \theta = -5$.

- 11 Find, to the *nearest ten minutes* or *nearest tenth of a degree*, all values of x in the interval $0^\circ \leq x < 360^\circ$ that satisfy the equation $6 \sin x + 3 = 2 \csc x$.

- 12 Find, to the *nearest degree*, all values of θ in the interval $0^\circ \leq \theta < 360^\circ$ which satisfy the equation $7 \cos \theta + 1 = 6 \sec \theta$.

- 13 In the interval $0^\circ \leq \theta < 360^\circ$, solve the equation $5 \cos \theta = 2 \sec \theta - 3$ algebraically for all values of θ , to the *nearest tenth of a degree*.

- 14 Find, to the *nearest degree*, all values of θ in the interval $0^\circ \leq \theta < 180^\circ$ that satisfy the equation $3 \tan^2 \theta + \frac{1}{\cot \theta} = 2$.

F.TF.B.7: Trigonometric Equations 4 Answer Section

1 ANS: 3 REF: 080130siii

2 ANS: 3

$$-\sqrt{2} \sec x = 2$$

$$\sec x = -\frac{2}{\sqrt{2}}$$

$$\cos x = -\frac{\sqrt{2}}{2}$$

$$x = 135, 225$$

REF: 011322a2

3 ANS:

$$\sec x = \sqrt{2}$$

$$\cos x = \frac{1}{\sqrt{2}}$$

$$\cos x = \frac{\sqrt{2}}{2}$$

$$x = 45^\circ, 315^\circ$$

REF: 061434a2

4 ANS:

$$5 \csc \theta = 8$$

$$\csc \theta = \frac{8}{5}$$

$$\sin \theta = \frac{5}{8}$$

$$\theta \approx 141$$

REF: 061332a2

5 ANS: 3 REF: 010229siii

6 ANS:

$$90^\circ, 210^\circ, 330^\circ$$

REF: 068639siii

7 ANS:

$$30^\circ, 150^\circ, 270^\circ$$

REF: 080040siii

8 ANS:
 $60^\circ, 180^\circ, 300^\circ$

REF: 018442siii

9 ANS:
 60° or $\frac{\pi}{3}$

REF: 060311siii

10 ANS:
 $30, 150$

REF: 018542siii

11 ANS:
 $22^\circ 20', 157^\circ 40', 241^\circ 30'$ and $298^\circ 30'$ or $22.3^\circ, 157.7^\circ, 241.5^\circ$ and 298.5°

REF: 010236siii

12 ANS:
 $31, 180, 329$

REF: 068036siii

13 ANS:
 $5 \cos \theta - 2 \sec \theta + 3 = 0$

$$5 \cos \theta - \frac{2}{\cos \theta} + 3 = 0$$

$$5 \cos^2 \theta + 3 \cos \theta - 2 = 0$$

$$(5 \cos \theta - 2)(\cos \theta + 1) = 0$$

$$\cos \theta = \frac{2}{5}, -1$$

$$\theta \approx 66.4, 293.6, 180$$

REF: 061539a2

14 ANS:
 $34^\circ, 135^\circ$

REF: 068737siii