

Name: _____
PC: Solving First Degree Trig Equations

Date: _____
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Examples:

1. Solve for θ , to the nearest degree in the interval $0^\circ \leq \theta \leq 360^\circ$.

$$3 \tan \theta - 4 = 5 \tan \theta - 1$$

2. Solve for θ in the interval $0 \leq \theta \leq 2\pi$.

$$2 \cos \theta + 3\sqrt{2} = 2\sqrt{2}$$

3. Solve for θ in the interval $0^\circ \leq \theta \leq 360^\circ$

$$8 \sec \theta - 2 = 10 + 2 \sec \theta$$

4. Solve for θ to the nearest degree in the interval $0^\circ \leq \theta \leq 360^\circ$

$$3(\sin \theta - 1) = -4$$

5. Solve for θ in the interval $0 \leq \theta \leq 2\pi$.

$$2 \sin \theta - 1 = 0$$

6. Solve for θ to the nearest degree in the interval $0^\circ \leq \theta \leq 360^\circ$

$$4 \cos \theta = \cos \theta + 2$$

7. For $0 \leq \theta \leq \pi$, solve:

$$\tan \theta \cos \theta - \tan \theta = 0$$

8. For $0^\circ \leq \theta \leq 360^\circ$, solve : $|2 \cos \theta - 3| = 5$

Use the table to help you obtain your answer after you find the reference angle.

To Find an Angle θ in Quadrant	Given Reference Angle R in Degrees	Given Reference Angle R in Radians
I	$\theta = R$	$\theta = R$
II	$\theta = 180^\circ - R$	$\theta = \pi - R$
III	$\theta = 180^\circ + R$	$\theta = \pi + R$
IV	$\theta = 360^\circ - R$	$\theta = 2\pi - R$

Exercises

Exercises 1–6: Solve for exact values of θ in the interval $0^\circ \leq \theta \leq 360^\circ$.

1 $2\tan \theta - 3 = -5$

2 $4(\csc \theta + 2) = \csc \theta + 14$

3 $2\sin \theta + 3 = 3(\sin \theta + 1)$

4 $2\cos \theta + 5\sqrt{3} = 4\sqrt{3}$

5 $6\left(\cot \theta - \frac{\sqrt{3}}{2}\right) = 5\cot \theta - 2\sqrt{3}$

6 $3\sin \theta - 1 = 2$

Exercises 7–12: Solve for exact values of θ in the interval $0 \leq \theta \leq 2\pi$.

7 $3\tan \theta - 4 = 4\tan \theta - 5$

8 $3\sec \theta = \frac{2}{3}(3\sec \theta - 3)$

9 $2(\sin \theta + \sqrt{2}) = \sqrt{2}$

10 $6\cos \theta + \sqrt{3} = -4(\cos \theta + \sqrt{3})$

11 $4\csc \theta + 5 = 3\csc \theta + 4$

12 $4\cos \theta + 3 = 3$

Exercises 13–17: Solve for β , to the nearest tenth of a degree, in the interval $0^\circ \leq \beta \leq 360^\circ$.

13 $9\sin \beta - 2 = 4\sin \beta - 1$

14 $-2(\tan \beta - 4) = 3(4 - \tan \beta)$

15 $3\sec \beta + 12 = \frac{3}{4}(8\sec \beta - 4)$

16 $\frac{1}{2}\csc \beta + 1 = \frac{1}{4}(\csc \beta + 8)$

17 $2\tan \beta - \sqrt{3} = 2\sqrt{3} - \tan \beta$

18 Find $m\angle B$ in the interval $180^\circ \leq B \leq 270^\circ$ that satisfies the equation $2\tan B - 3 = 3\tan B - 4$.

19 In the interval $90^\circ \leq x \leq 180^\circ$, find the value of x that satisfies the equation $3(\sin x - 2) = \sin x - 6$.

20 If $\frac{3\pi}{2} \leq \theta \leq 2\pi$, solve for θ : $5\cos \theta = 3\cos \theta + \sqrt{2}$

21 Find all values of x , to the nearest tenth of a degree, in the interval $0^\circ \leq x < 360^\circ$: $|3\cos \theta + 1| = 2$

22 Solve for all values of θ in the interval $0^\circ \leq \theta < 360^\circ$: $\sqrt{2}\sin x + 7 + 1 = 4$

Exercises 23–30: Select the numeral preceding the choice that best completes the statement or answers the question.

23 If θ is a positive acute angle, and $2\tan \theta = 7$, what is the value of θ to the nearest degree?

(1) $\frac{7}{2}$

(2) 16°

(3) 27°

(4) 74°