

Name: \_\_\_\_\_  
PCH: Solving First Degree Trig Equations

Date: \_\_\_\_\_  
Ms. Loughran

Do Now:

Find the exact value of each of the following trigonometric functions:

1.  $\cot \frac{5\pi}{6}$

2.  $\csc \frac{4\pi}{3}$

3.  $\sec -\frac{7\pi}{4}$

Examples:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**HOMEWORK SECTION IS ON NEXT PAGE.**

To Find an Angle $\theta$ 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  $\theta$  in the interval  $0^\circ \leq \theta \leq 360^\circ$ .

- $2\tan \theta - 3 = -5$
- $4(\csc \theta + 2) = \csc \theta + 14$
- $2\sin \theta + 3 = 3(\sin \theta + 1)$
- $2\cos \theta + 5\sqrt{3} = 4\sqrt{3}$
- $6\left(\cot \theta - \frac{\sqrt{3}}{2}\right) = 5\cot \theta - 2\sqrt{3}$
- $3\sin \theta - 1 = 2$

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

- $3\tan \theta - 4 = 4\tan \theta - 5$
- $3\sec \theta = \frac{2}{3}(3\sec \theta - 3)$
- $2(\sin \theta + \sqrt{2}) = \sqrt{2}$
- $6\cos \theta + \sqrt{3} = -4(\cos \theta + \sqrt{3})$
- $4\csc \theta + 5 = 3\csc \theta + 4$
- $4\cos \theta + 3 = 3$

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

- $9\sin \beta - 2 = 4\sin \beta - 1$
- $-2(\tan \beta - 4) = 3(4 - \tan \beta)$
- $3\sec \beta + 12 = \frac{3}{4}(8\sec \beta - 4)$

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

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

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

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

- $\frac{7}{2}$
- $16^\circ$
- $27^\circ$
- $74^\circ$