Name:_____ Date:_____

PC: Solving First Degree Trig Equations

Examples:

1. Solve for θ, to the nearest degree in the interval $0° \le \theta \le 360°$.

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

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

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

3. Solve for θ in the interval $0° \le \theta \le 360°$

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

4. Solve for θ to the nearest degree in the interval $0° \le \theta \le 360°$

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

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

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

6. Solve for θ to the nearest degree in the interval $0° \le \theta \le 360°$

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

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

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

8. For $0° \le \theta \le 360°$, 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	$\theta = 180° - R$	$\theta = \pi - R$
III	$\theta = 180° + R$	$\theta = \pi + R$
IV	$\theta = 360° - R$	$\theta = 2\pi - R$

Exercises

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

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

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

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 $0° \leq \beta \leq 360°$.

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 $180° \leq B \leq 270°$ that satisfies the equation $2\tan B - 3 = 3\tan B - 4$.

19 In the interval $90° \leq x \leq 180°$, 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 $0° \leq x < 360°$: $|3\cos\theta + 1| = 2$

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

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) $74°$