· sec → cos csc → sin cot → tan

Assignment * Degree mode

S	A
T	C

1. Determine the measure(s) of θ, to the nearest degree, where $0° \le \theta \le 360°$.

a) $\sin\theta = 0.7301$

(+) Q 1 + 2

ref ∠ = 47°

θ = 47°, 180 − 47°

= 47°, 133°

b) $\cos\theta = -0.9580$

(−) Q 2 + 3

ref ∠ = 17°

θ = 180 − 17, 180 + 17

= 163°, 197°

c) $\tan\theta = \frac{5}{2}$

(+) Q 1 + 3

ref ∠ = 68°

θ = 68°, 180 + 68

= 68°, 248°

d) $\sin\theta = -1$

(−) Q 3 | 4.

ref ∠ = 90°

θ = 180 + 90, 360 − 90

θ = 270°

2. Determine the measure of A, to the nearest degree, for the specified domain.

a) $\sec A = 1.2364, 0° \le A \le 360°$

$\cos A = \frac{1}{1.2364}$ (+) Q 1 + 4

ref ∠ = 36°

θ = 36°, 360 − 36

= 36°, 324°

b) $\cot A = -0.4458, 180° \le A \le 360°$

(−) Q 2 + 4 $\tan A = \frac{-1}{0.4458}$

ref ∠ = 66°

θ = 360 − 66

= 294°

c) $\csc A = 1.0138, 0° \le A \le 180°$

(+) Q 1 + 2

$\sin A = \frac{1}{1.0138}$, ref ∠ = 81°

A = 81°, 180 − 81

= 81°, 99°

d) $\cot A$ is undefined $0° \le A \le 360°$

tan A = 0, quad 1, 2, 3, 4.

ref ∠ = 0°

∠A = 0°, 180° − 0, 180 + 0, 360 − 0

= 0°, 180°, 360°

3. Solve for θ, to the nearest degree, where $0° \le \theta \le 360°$.

a) $\tan^2\theta = 3$

$\tan\theta = \pm\sqrt{3}$

Q 1-4

ref ∠ = 60

θ = 60, 180 − 60, 180 + 60, 360 − 60

θ = 60°, 120°, 240°, 300°

b) $\sec^2\theta = \frac{4}{3}$

$\cos^2\theta = \frac{3}{4}$ $\cos\theta = \pm\frac{\sqrt{3}}{2}$ Q 1-4

ref ∠ = 30°

θ = 30°, 180 − 30, 180 + 30, 360 − 30

θ = 30°, 150°, 210°, 330°

Radian mode

S | A
T | C

4. In each case, determine the value(s) of x to the nearest hundredth of a radian.

a) $\tan x = 0.5371,\ 0 \le x \le 2\pi$

(+) Q 1|3

ref $\angle$ = 0.4929

$x = 0.4929,\ \pi + 0.4929$

$= 0.49; 3.63$

b) $\cot x = -1.5,\ 0 \le x \le 2\pi$

$\tan x = \frac{-1}{1.5}$ (−) Q 2 & 4

ref $\angle$ = 0.5880

$x = \pi - 0.5880,\ 2\pi - 0.5880$

$= 2.55,\ 5.70$

c) $\csc x = 6,\ 0 \le x \le \pi$

$\sin x = \frac{1}{6}$ (+) Q 1 & 2

ref $\angle$ = 0.1674

$x = 0.17,\ \pi - 0.1674$

$= 0.17, 2.97$

d) $\cos x = -\frac{4}{5},\ \pi \le x \le 2\pi$

(−) Q 2 & 3

ref $\angle$ = 0.6435

$x = \pi + 0.6435$

$= 3.79$

5. In each case, determine the exact values of θ in the interval $0 \le \theta \le 2\pi$, for which

a) $\sin\theta = \frac{1}{2}$

(+) Q 1 & 2

ref $\angle = \frac{\pi}{6}$

$\theta = \frac{\pi}{6},\ \pi - \frac{\pi}{6} = \frac{\pi}{6}, \frac{5\pi}{6}$

b) $\cos\theta = -\frac{1}{\sqrt{2}}$

(−) Q 2 & 3

ref $\angle = \frac{\pi}{4}$

$\theta = \pi - \frac{\pi}{4},\ \pi + \frac{\pi}{4}$

$= \frac{3\pi}{4}, \frac{5\pi}{4}$

c) $\tan\theta = -1$ (−) Q 2 & 4.

ref $\angle = \frac{\pi}{4}$

$\theta = \pi - \frac{\pi}{4},\ 2\pi - \frac{\pi}{4}$

$= \frac{3\pi}{4}, \frac{7\pi}{4}$

d) $\cot\theta = \sqrt{3}$

$\tan\theta = \frac{1}{\sqrt{3}}$

(+) Q 1 & 3

ref $\angle = \frac{\pi}{6}$

$\theta = \frac{\pi}{6},\ \pi + \frac{\pi}{6}$

$= \frac{\pi}{6}, \frac{7\pi}{6}$

e) $\csc\theta = 1$

$\sin\theta = 1$

(+) Q 1 & 2

ref $\angle = \frac{\pi}{2}$

$\theta = \frac{\pi}{2},\ \pi - \frac{\pi}{2}$

$\theta = \frac{\pi}{2}$

f) $\sec\theta = 2$

$\cos\theta = \frac{1}{2}$ (+) Q 1 & 4

ref $\angle = \frac{\pi}{3}$

$\theta = \frac{\pi}{3},\ 2\pi - \frac{\pi}{3}$

$= \frac{\pi}{3}, \frac{5\pi}{3}$

S | A
T | C

6. Find the values of each angle θ if $0 \le \theta \le 2\pi$.

a) $\cot^2\theta = 3$

$\tan^2\theta = \frac{1}{3}$

$\tan\theta = \pm\sqrt{\frac{1}{3}}$

Q1-4

ref $\angle = \pi/6$

$\theta = \frac{\pi}{6}, \pi - \frac{\pi}{6}, \pi + \frac{\pi}{6}, 2\pi - \frac{\pi}{6}$

$\theta = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

b) $\csc^3\theta = -8$

$\sin^3\theta = -\frac{1}{8}$ (−) Q3+4.

$\sin\theta = \sqrt[3]{-\frac{1}{8}} = -\frac{1}{2}$

ref $\angle = \frac{\pi}{6}$

$\theta = \pi + \frac{\pi}{6}, 2\pi - \frac{\pi}{6}$

$= \frac{7\pi}{6}, \frac{11\pi}{6}$

DEGREE MODE!

Multiple Choice

7. The values of x for which $\sec x = -10.366$ in the interval $0° \le x \le 360°$ are

A. 84°, 276°
B. 96°, 264°
C. 96°, 276°
D. 264°, 276°

$\cos x = \frac{-1}{10.366}$ (−) Q2+3

ref $\angle = 84°$

$x = 180 - 84, 180 + 84$

$x = 96°, 264°$

8. The domain for which $\sec\theta = -3.1$ has two solutions is

A. $0 \le \theta \le \pi$
B. $\pi \le \theta \le 2\pi$
C. $\frac{\pi}{2} \le \theta \le \frac{3\pi}{2}$
D. none of the above

$\cos\theta = -\frac{1}{3.1}$ (−) Q2+3

9. Which of the following has a solution in the interval $0 \le x \le 2\pi$ which can be expressed as an exact multiple of π radians?

A. $\tan x = \frac{1}{2}$ ref $\angle = 0.4636\ldots$
B. $\cot x = \sqrt{2}$ $\tan x = \frac{1}{\sqrt{2}}$ ref $\angle = 0.6154$
C. $\csc^2 x = -\frac{1}{4}$ not poss
D. $\sec^2 x = \frac{4}{3}$ $\cos^2 x = \frac{3}{4}$ $\cos x = \pm\sqrt{\frac{3}{4}} = \pm\frac{\sqrt{3}}{2}$

ref $\angle = \frac{\pi}{6}$

10. If $\csc\theta = \frac{7}{2}$, then one approximate measure in radians for θ is

RADIAN MODE

(A) 2.852
B. 2.897
C. 3.431
D. 5.993

$\sin\theta = \frac{2}{7}$

$\theta = 0.2987, \pi - 0.2987$

$= 0.2987, 2.8518$

(+) Q1 & 2.

ref $\angle = 0.2891$

Numerical Response **11.** To the nearest tenth of a radian, the value of x for which $\cot x = -\frac{1}{4}$ and $\pi \le x \le 2\pi$ is _____.

(Record your answer in the numerical response box from left to right.)

5	.	0	

S | A
T | C

$\tan x = -4$ (÷) Q 2 & 4

ref $\angle = 1.3258$

$x = 2\pi - 1.3258$

$= 4.9573$

Answer Key

1. a) 47°, 133° b) 163°, 197° c) 68°, 248° d) 270°

2. a) 36°, 324° b) 294° c) 81°, 99° d) 0°, 180°, 360°

3. a) 60°, 120°, 240°, 300° b) 30°, 150°, 210°, 330°

4. a) 0.49, 3.63 b) 2.55, 5.70 c) 0.17, 2.97 d) 3.79

5. a) $\frac{\pi}{6}, \frac{5\pi}{6}$ b) $\frac{3\pi}{4}, \frac{5\pi}{4}$ c) $\frac{3\pi}{4}, \frac{7\pi}{4}$ d) $\frac{\pi}{6}, \frac{7\pi}{6}$ e) $\frac{\pi}{2}$ f) $\frac{\pi}{3}, \frac{5\pi}{3}$

6. a) $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$ b) $\frac{7\pi}{6}, \frac{11\pi}{6}$

7. B 8. C 9. D 10. A 11.

5	.	0	