
Read Me First: *Show all essential work neatly. Use correct notation when presenting your computations. Write using complete sentences. In particular, be very careful when using "=", **equals**, and " $\Rightarrow$ ", **implies**. Do not "box" your answers. Communicate.*

1. (5 pts.) If $\theta = -330^\circ$, what is the radian measure of θ as an exact multiple of π ? $\theta = -(11/6)\pi$

2. (5 pts.) If $\theta = 5\pi/6$ in radian measure, what is the value of θ in degrees? $\theta = 150^\circ$

3. (5 pts.) If $s = 4$ meters is the length of an arc of a circle of radius $r = 6$ meters subtended by a central angle θ , what is the exact value of θ in degrees? $\theta = (120/\pi)^\circ$

4. (5 pts.) If $\theta = 61^\circ 25' 21''$, convert θ to a decimal in degrees rounded to two decimal places. $\theta = 61.42^\circ$

5. (5 pts.) If $\theta = 28.211^\circ$, convert θ to $D^\circ M' S''$ form with the answer rounded to the nearest second. $\theta = 28^\circ 12' 40''$

6. (5 pts.) An object is traveling around a circle with a radius of 10 meters. Suppose that in 20 seconds a central angle of $1/3$ radian is swept out. What is the angular speed ω of the object, and what is the linear speed v of the object? *Here give the exact value of the item followed by its decimal approximation.*
 $\omega = (1/60)$ radians/sec. $\approx .016\bar{6}$ radians/sec.
 $v = (1/6)$ meters/sec. $\approx .16\bar{6}$ meters/sec.

7. (5 pts.) If θ is an acute angle, and $\sin(\theta) = 1/3$, obtain the exact values for the remaining five trigonometric functions.
 $\tan(\theta) = 1/8^{1/2}$; $\cot(\theta) = 8^{1/2}$; $\sec(\theta) = 3/8^{1/2}$;
 $\csc(\theta) = 3$; $\cos(\theta) = 8^{1/2}/3$

8. (5 pts.) If the point $(4, -5)$ is on the terminal side of an angle θ , obtain the exact value of each of the six trigonometric functions of θ . $\sin(\theta) = -5/(41)^{1/2}$; $\cos(\theta) = 4/(41)^{1/2}$;
 $\tan(\theta) = -5/4$; $\cot(\theta) = -4/5$; $\sec(\theta) = (41)^{1/2}/4$;
 $\csc(\theta) = -(41)^{1/2}/5$

9. (5 pts.) What is the reference angle θ_r for an angle $\theta = -215^\circ$? $\theta_r = 35^\circ$

10. (5 pts.) Suppose $\cos \theta = -(3/5)$ and $\tan \theta > 0$. What is the exact value of each of the remaining trigonometric functions?
 $\sec(\theta) = -5/3$; $\tan(\theta) = 4/3$; $\sin(\theta) = -4/5$; $\csc(\theta) = -5/4$;
 $\cot(\theta) = 3/4$;

11. (18 pts.) Fill in the following table with the information requested concerning domain, range, and period.

Function Name	Domain (in radians)	Range	Period (in radians)
$\cos(\theta)$	$\mathbb{R}$	$[-1, 1]$	2π
$\csc(\theta)$	B, below.	$(-\infty, -1] \cup [1, \infty)$	2π
$\cot(\theta)$	B, below.	$\mathbb{R}$	π
$\sec(\theta)$	A, below.	$(-\infty, -1] \cup [1, \infty)$	2π
$\tan(\theta)$	A, below.	$\mathbb{R}$	π
$\sin(\theta)$	$\mathbb{R}$	$[-1, 1]$	2π

$$A = \{ x \in \mathbb{R} : x \neq (2k + 1)(\pi/2), k \text{ any integer} \}$$

$$B = \{ x \in \mathbb{R} : x \neq k\pi, k \text{ any integer} \}$$

12. (2 pts.) Use a calculator to obtain the approximate value of each of the following expressions. Round your answer to two decimal places. $\sin 20 \approx .91$ $\sin 20^\circ \approx .34$

13., 14., 15.: Partial graphs may be found in the text. They generally don't show two periods that are symmetric with respect to the origin.