

Name _____ Date _____ Per _____

Show all the work. NO WORK = NO CREDIT

I. In problems 1-4, θ is an angle in standard position whose terminal side lies on the given quadrant. Find a) $\sin 2\theta$, b) $\cos 2\theta$, and c) $\tan 2\theta$.

1) $\sin \theta = \frac{3}{5}$, Q-II

2) $\cos \theta = -\frac{5}{13}$, Q-III

3) $\sin \theta = -\frac{12}{13}$, Q-IV

4) $\cos \theta = \frac{7}{25}$, Q-I

II. In problems 5-10, use $\frac{1}{2}$ angle formulas to evaluate each expression.

5) $\sin 15^\circ$

6) $\sin 75^\circ$

7) $\cos 15^\circ$

8) $\tan 75^\circ$

a) $-\frac{24}{25}$ 1)	b) $\frac{1}{25}$	c) $-\frac{24}{7}$
a) $\frac{120}{169}$ 2)	b) $-\frac{119}{169}$	c) $-\frac{120}{119}$
a) $-\frac{120}{169}$ 3)	b) $-\frac{119}{169}$	c) $\frac{120}{119}$
a) $\frac{336}{625}$ 4)	b) $-\frac{527}{625}$	c) $-\frac{336}{527}$
5)	$\frac{\sqrt{2-\sqrt{3}}}{2}$	
6)	$\frac{\sqrt{3+\sqrt{3}}}{2}$	
7)	$\frac{\sqrt{2+\sqrt{3}}}{2}$	
8)	$2 + \sqrt{3}$	
9)	$\frac{3\sqrt{10}}{10}$	
10)	$-\frac{\sqrt{66}}{10}$	

9) $\sin \frac{x}{2}$, if $\sin x = -\frac{3}{5}$, and $(\frac{\pi}{2} < x < \frac{3\pi}{2})$ *

$\cos x = -\frac{4}{5}$

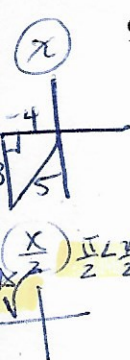
$\sin \frac{x}{2} = +\sqrt{\frac{1-\cos x}{2}}$

$= +\sqrt{\frac{1+\frac{4}{5}}{2}}$

10) $\cos \frac{x}{2}$, if $\cos x = \frac{8}{25}$ and $\frac{3\pi}{2} < x < 2\pi$

$\cos \frac{x}{2} = -\sqrt{\frac{1+\frac{8}{25}}{2}}$

$\frac{1}{2} \cdot \frac{3\pi}{2} < \frac{x}{2} < \frac{1}{2} \cdot 2\pi$
 $\left[\frac{3\pi}{4} < \frac{x}{2} < \pi \right]$



negative and ^{Least} positive angle coterminal with $-\frac{5\pi}{6}$.

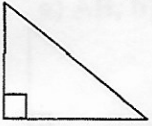
12) Find the reference angle for 318° .

13) Find $\cos \theta$ if $\frac{\pi}{2} < \theta < \pi$, and $\tan \theta = -\frac{4}{3}$.

14) If $\cos \theta = -\frac{15}{17}$, and $\sin \theta > 0$, find $\cot \theta$.

15) Express $\sin(-320^\circ)$ as a function of an angle in Quadrant I.

16) Given right $\triangle ABC$, $m\angle C = 90^\circ$, $m\angle B = 40^\circ$, $AC = 10$. Find
a) AB, b) BC and c) $m\angle A$. Round answers to the nearest tenth.



17) If $\cos x = \frac{3}{5}$, and $\sin x < 0$, find $\cos 2x$.

18) Find the length of an arc "s" of a circle with radius=4 and a central angle = 120° .

19) Find the exact values of:

a) $\csc\left(-\frac{11\pi}{6}\right)$

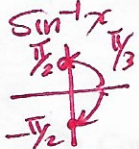
b) $\tan(-\pi)$

c) $\cot \pi$

d) $\sec \frac{3\pi}{2}$

20) Find the area of a triangle with sides 7, 14, and 20. Round to the nearest unit.

21) Evaluate: $\sin^{-1}\left(\cos \frac{\pi}{6}\right)$



22) Evaluate: $\sin^{-1}\left(\cos \frac{\pi}{6}\right)$ for $[0 \leq x \leq 2\pi]$.

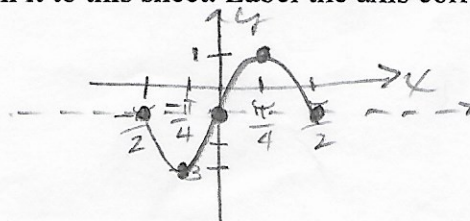


$\sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = \left[\frac{\pi}{3}\right]$

$\frac{2\pi}{3}$

23) Consider the equation: $y = -2\sin(2x + \pi) - 1$. Find: a,b,c,d, and the period. Graph the function.

Label the axis correctly. Use graph paper to graph it. Attach it to this sheet. Label the axis correctly.



Per: π
invariant $\frac{\pi}{4}$

11)	$\frac{7\pi}{6}, -\frac{17\pi}{6}$
12)	42°
13)	$-\frac{3}{5}$
14)	$-\frac{15}{8}$
15)	$\sin 40^\circ$
16)	a) 15.6 b) 11.9 c) 50°
17)	$-\frac{7}{25}$
18)	$\frac{8\pi}{3}$
19 a)	2 b) 0
	c) UND d) UND
20)	30 sq. units
21)	$\frac{\pi}{3}$
22)	$\frac{\pi}{3}, \frac{2\pi}{3}$
23)	a = -2 b = 2
	c = $-\frac{\pi}{2}$ d = -1 per = π
	reflection? <u>yes</u> /no