Name_____

1) SHOW THE TABLE OF VALUES FOR THE SINE, COSINE AND TANGENT OF THE 5 REFERENCE ANGLES

	0..........	....	....	....	....
sin α					
cos α					
tan α					

2) Write the definitions of the trigonometric functions using the triangle approach.

sin x =   cos x =   tan x =

3) a) Write the reciprocal identities.

b) Write the quotient identities.

c) Write the basic Pythagorean identity. Where is this coming from? Label the three sides of the triangle in the unit circle.

4) Write the signs of the SIX trigonometric functions in the following graphs:

5) Write the two equations that relate the period and w for the functions y = sin wx and y = cos wx.

6) a) Write the relationships between degrees and radians.

b) Write the relationships between degrees, minutes and seconds

7) Write the coordinates of the points A, B, C, D, in the unit circle.

In the unit circle y = ..., and x = ...

Use those coordinates to complete the following table:

	.....0............	.....$\pi/2$.....	.....π.........	.....$3\pi/2$.....
sin α				
cos α				
tan α				
cot α				
sec α				
csc α				

8) Sketch the graph of the angle x (in the first quadrant), then, in the same coordinate system sketch the graph of the angle $(x + \pi)$.

Use the graphs and think about the signs of the trig functions in each quadrant to answer the following.
In each row, circle the correct expression:

$\sin (x + \pi) = \sin x$ $\sin (x + \pi) = -\sin x$

$\cos (x + \pi) = \cos x$ $\cos (x + \pi) = -\cos x$

$\tan (x + \pi) = \tan x$ $\tan (x + \pi) = -\tan x$

$\cot (x + \pi) = \cot x$ $\cot (x + \pi) = -\cot x$

$\sec (x + \pi) = \sec x$ $\sec (x + \pi) = -\sec x$

$\csc (x + \pi) = \csc x$ $\csc (x + \pi) = -\csc x$

9) Sketch the graph of the angle x (in the first quadrant), then, in the same coordinate system sketch the graph of the angle $(\pi - x)$.

Use the graphs and think about the signs of the trig functions in each quadrant to answer the following. In each row, circle the correct expression:

$\sin(\pi - x) = \sin x$	$\sin(\pi - x) = -\sin x$
$\cos(\pi - x) = \cos x$	$\cos(\pi - x) = -\cos x$
$\tan(\pi - x) = \tan x$	$\tan(\pi - x) = -\tan x$
$\cot(\pi - x) = \cot x$	$\cot(\pi - x) = -\cot x$
$\sec(\pi - x) = \sec x$	$\sec(\pi - x) = -\sec x$
$\csc(\pi - x) = \csc x$	$\csc(\pi - x) = -\csc x$

10) Sketch the graph of the angle x (in the first quadrant), then, in the same coordinate system sketch the graph of the angle $(-x)$.

Use the graphs and think about the signs of the trig functions in each quadrant to answer the following. Circle the correct expression:

$\sin(-x) = \sin x$	$\sin(-x) = -\sin x$
$\cos(-x) = \cos x$	$\cos(-x) = -\cos x$
$\tan(-x) = \tan x$	$\tan(-x) = -\tan x$
$\cot(-x) = \cot x$	$\cot(-x) = -\cot x$
$\sec(-x) = \sec x$	$\sec(-x) = -\sec x$
$\csc(-x) = \csc x$	$\csc(-x) = -\csc x$

Convert the angle to decimal degrees and round to the nearest hundredth of a degree.

11) $87°2'31''$ SHOW WORK. NO WORK = NO CREDIT

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Convert the angle to degrees, minutes, and seconds.

    12) $14.63°$ SHOW WORK. NO WORK = NO CREDIT

Convert the degree measurement to radians. Express answer as multiple of π.

    13) $140°$ SHOW WORK. NO WORK = NO CREDIT

Convert the radian measure to degrees. (Round to the nearest hundredth when necessary)

    14) $\dfrac{12\pi}{7}$ SHOW WORK. NO WORK = NO CREDIT

Give the exact value. Do not use the calculator.

    15) $\csc 60°$ SHOW WORK. NO WORK = NO CREDIT

Find the exact value of the expression. Do not use a calculator.

    16) $\cos \dfrac{8\pi}{3}$ SHOW WORK. NO WORK = NO CREDIT

show graph	reference angle	is the value positive or negative?	final answer including sign

17) Find the exact value. Do not use a calculator.
cos 120° tan 210°.   SHOW WORK. NO WORK = NO CREDIT

a) show work for 120° here:

show graph	reference angle	is the function positive or negative?	final answer including sign

a) show work for 210° here:

show graph	reference angle	is the function positive or negative?	final answer including sign

c) ANSWER TO THE PROBLEM

Find the approximate value of the expression. Write all decimals you see in your calculator.

18) $\sec \dfrac{\pi}{8}$

Name the quadrant in which the angle θ lies.

19) $\csc \theta < 0$ and $\cot \theta < 0$ SHOW WORK. NO WORK = NO CREDIT

Find the exact value of the requested trigonometric function of θ.

20) Given that $\sin\theta = -\dfrac{4}{7}$ and $\tan\theta > 0$ Find $\sec\theta$.

<p align="center">SHOW WORK. NO WORK = NO CREDIT</p>

Find the exact value of the expression.

21) $\sec\left(-\dfrac{\pi}{3}\right)$　　　SHOW WORK. NO WORK = NO CREDIT

show graph	reference angle	is the function positive or negative?	final answer including sign

22) P(–8, 2) is a point on the terminal side of angle θ.

<p align="center">SHOW WORK. NO WORK = NO CREDIT</p>

a) Find $\cos\theta$

b) Find $\cot\theta$

In the problem, t is a real number and P=(x,y) is the point on the unit circle that corresponds to t. Find the exact value of the given trigonometric function.

23) $\left(-\dfrac{\sqrt{33}}{7}, \dfrac{4}{7}\right)$; find $\cos t$

Solve the problem.

24) If friction is ignored, the time t (in seconds) required for a block to slide down an inclined plane is given by the formula

$$t = \sqrt{\frac{2a}{g \sin\theta \cos\theta}}$$

where a is the length (in feet) of the base and $g \approx 32$ feet per second per second is the acceleration of gravity. How long does it take a block to slide down an inclined plane with base a = 8 when $\theta = 45°$? Round the final answer to the nearest tenth of a second.

25) The displacement d, in inches, from equilibrium of a weight suspended from a spring is given by

$$d = 1 + 2 \sin(15t)°$$

where t in time in seconds. Find the displacement when $t = 0, 2, 4, 6, 8, 10$, and 12 seconds. Do not use a calculator.

26) Find the exact value of $\tan\frac{7\pi}{4} + \tan\frac{5\pi}{4}$. Do not use a calculator.

27) Which of the following trigonometric values are negative?
   I. $\sin(-292°)$
   II. $\tan(-193°)$
   III. $\cos(-207°)$
   IV. $\cot 222°$

    A) II, III, and IV   B) III only   C) I and III   D) II and III

28) f(t) = sint t; g(t) = cos t

Let t = 30⁰ = $\pi/6$

Find each of the following:

a) f(t)

b) 2 g(t)

c) f(2t)

d) g(–t)

e) 2 f(t + π)

f) g(π–t)

g) f($\frac{\pi}{2}$–t)

h) – 3 f(3t)

i) [g(t)]^2

j) g(2t) – 3 f(–2t)

k) f(t) + f(t + 2π) + f(t – 2π)