Directions: Use your book and notes to complete this worksheet. This worksheet is a review of everything you have learned this semester, so don't tell me you don't know how to do this ☺ Look it up!!

Find each trigonometric value using either your unit circle or calculator. If the answer can be written in exact form, DO NOT USE A CALCULATOR. Show ALL of your work.

1. $\sin 150°$ $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

$\boxed{\frac{1}{2}}$

2. $\csc 32°$

4 calc

$\frac{1}{\sin 32°} = \boxed{1.89}$

3. $\tan\left(\frac{5\pi}{3}\right)$ $\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$

$\frac{-\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \boxed{-\sqrt{3}}$

4. $\cot \frac{\pi}{2}$ $(0, 1)$

$\frac{0}{1} = \boxed{0}$

5. $\cos 690°$

$\cos 330°$ $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$

$\boxed{\frac{\sqrt{3}}{2}}$

6. $\cos 198° 15' 42''$

4 calc

$\boxed{-.950}$

7. $\tan 60°$ $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

$\frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \boxed{\sqrt{3}}$

8. $\sin 45°$

$\boxed{\frac{\sqrt{2}}{2}}$

9. $\sin\left(-\frac{\pi}{6}\right) = \sin\left(\frac{11\pi}{6}\right)$

$\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$

$\boxed{-\frac{1}{2}}$

10. $\csc \frac{5\pi}{3} = \frac{1}{\sin\left(\frac{5\pi}{3}\right)}$

$\frac{1}{\left(-\frac{\sqrt{3}}{2}\right)} = \boxed{-\frac{2\sqrt{3}}{3}}$

11. $\tan -99°$

4 calc

$\boxed{6.31}$

12. $\tan\left(\frac{\pi}{6}\right)$ $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

$\frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{\sqrt{3}}{3}}$

Define the following formulas:

Law of Sines

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

When do we use this formula?

Law of Cosines

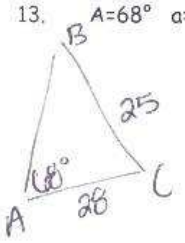
$$a^2 = b^2 + c^2 - 2bc\cos A$$

When do we use this formula?

Use either the Law of Sines or Law of Cosines to solve for the following triangles.

a) Draw a diagram
b) Check whether there is a possibility for an ambiguous case of law of sines
c) Find all missing angles and side lengths

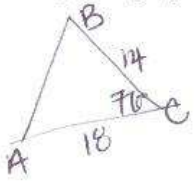
13. A=68° a=25 b=28



$\frac{25}{\sin 68} = \frac{28}{\sin B}$

NO SOLN

14. C=76° a=14 b=18 — L.O.C.



$c^2 = 14^2 + 18^2 - 2(14)(18)\cos 76°$

$c = 19.95$

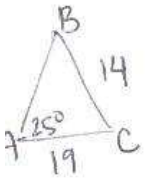
$\frac{19.95}{\sin 76} = \frac{14}{\sin A}$

$\angle A = 42.9°$
$\angle B = 61.1°$

15. $A = 25°, a = 14, b = 19$

$19\sin 25° < 14 < 19$

True → 2 solns!



$\frac{14}{\sin 25°} = \frac{19}{\sin B}$

$\angle B = 34.9°$
$\angle C = 120.1°$

$\frac{14}{\sin 25°} = \frac{c}{\sin 120.1°}$

$180 - 34.9° = 145.1° = \angle B$
$9.9° < \angle C$

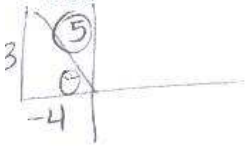
$\frac{c}{\sin 9.9} = \frac{19}{\sin 145.1}$

$c = 5.71$

16. Find the **reference angle** for the following degrees:

23°	213°	−47°	−213°
23°	33°	47°	33°

17. Find the 6 trig functions of an angle in standard position if a point with (-4, 3) lies on its terminal side.

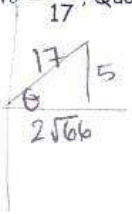


$\sin\theta = \frac{3}{5}$ $\csc\theta = \frac{5}{3}$

$\cos\theta = -\frac{4}{5}$ $\sec\theta = -\frac{5}{4}$

$\tan\theta = \frac{-3}{4}$ $\cot\theta = \frac{4}{3}$

18. Suppose θ is an angle in standard position whOse terminal side lies in the given quadrant. Find the value of the remaining 5 trig functions if $\sin\theta = \frac{5}{17}$, Quadrant I.



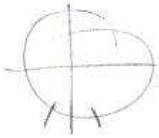
$\sin\theta = \frac{5}{17}$ $\csc\theta = \frac{17}{5}$

$\cos\theta = \frac{2\sqrt{66}}{17}$ $\sec\theta = \frac{17\sqrt{66}}{132}$

$\tan\theta = \frac{5\sqrt{66}}{132}$ $\cot\theta = \frac{2\sqrt{66}}{5}$

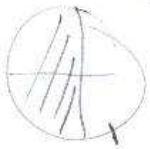
Find the inverse trig function using your unit circle. Remember to differentiate when there are many answers or just one answer.

19. $\sin x = -\frac{\sqrt{3}}{2}$



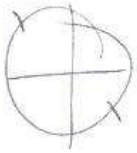
$X = \frac{4\pi}{3}, \frac{5\pi}{3}$

20. $\sin x = -\frac{\sqrt{3}}{2}$



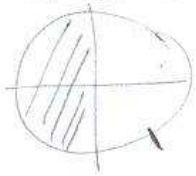
$X = -\frac{\pi}{3}$

21. $\tan x = -1$



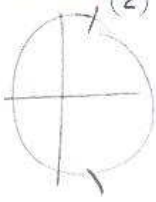
$X = \frac{3\pi}{4}, \frac{7\pi}{4}$

22. $\tan x = -1$



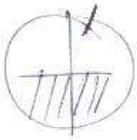
$X = -\frac{\pi}{4}$

23. $\cos^{-1}\left(\frac{1}{2}\right) = X$



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

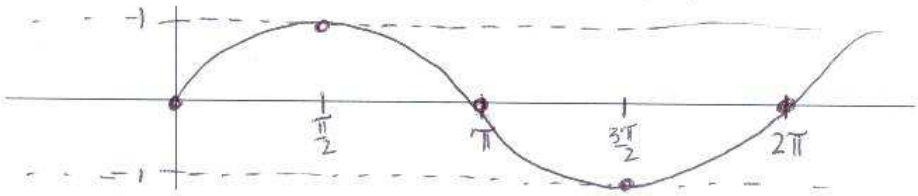
24. $\cos^{-1}\left(\frac{1}{2}\right)$



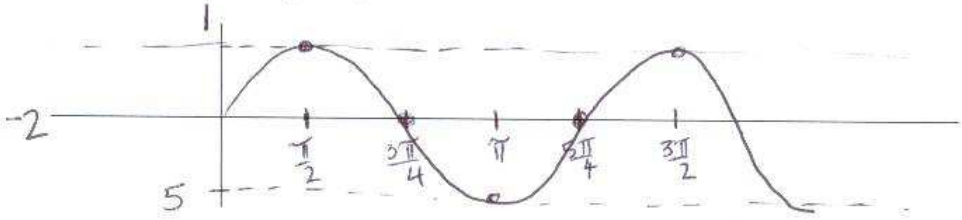
$X = \frac{\pi}{3}$

25. Graph $y = \sin x$. Then, using your graph find the following values...

$\sin(0) =$ 0 $\quad \sin\left(\frac{\pi}{2}\right) =$ 1 $\quad \sin(\pi) =$ 0 $\quad \sin\left(\frac{3\pi}{2}\right) =$ −1 $\quad \sin(2\pi) =$ 0

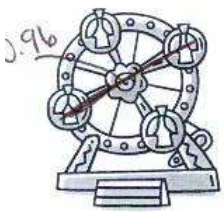


26. Graph $y = -2 + 3\cos 2\left(x - \frac{\pi}{2}\right)$ A= 3 B= 2 p= $\frac{2\pi}{2} = \pi$ C= −2 D= $\frac{\pi}{2} \rightarrow$



27. Since the giant Ferris wheel in Vienna, Austria was completed in 1897, it has been a major attraction for residents and tourists. The giant Ferris wheel has a height of 64.75 meters and a diameter of 60.96 meters. It makes a revolution every 4.25 minutes. On her summer vacation in Vienna, Carla starts timing her ride at the midline point at 11:35 am as she is on her to way up. When Carla reaches an altitude of 60 meters, she will have a view of the Vienna Opera House. When will she has this view for the first time?

Hint: First write an equation to model the height of a seat at any time t. Then solve the equation for when y=60.



$A = \frac{60.96}{2} = 30.48$

$p = 4.25 \rightarrow B = \frac{2\pi}{4.25} = \frac{8\pi}{17}$

$C = (64.75 - 60.96) + 30.48$

$C = 34.27$

D = none b/c starts @ midline

$y = 34.27 + 30.48 \sin \frac{8\pi}{17}(x)$

$60 = 34.27 + 30.48 \sin \frac{8\pi}{17} x$

$\frac{25.73}{30.48} = \frac{30.48 \sin \frac{8\pi}{17} x}{30.48}$

$.844 = \sin \frac{8\pi}{17} x$

$\sin^{-1}(.844) = \frac{8\pi}{17} x$

$57.58 = \frac{8\pi}{17} \cdot x$

$38.95 = x$