W E E K E N D   Q U I C K I E

Horatio Hypochondria has been absent from school so long that even he has forgotten where his desk is in the classroom. Horatio called *you* about 6:30 P.M. (Horatio, as we all know, has more brass than a band.) and begged you to "catch him up" on what he has missed in your favorite class, **TRIGONOMETRY**. Horatio seems to have forgotten everything! You start to panic and then remember that *your* awesome trig expertise will save the day for Horatio. *You* can change Horatio from a lowly pretender to a worthy contender! You quickly jot down the following list of topics.
You will turn in your written (and very explicit answers) to the following questions. Include drawings when they will help to clarify a point you are making but remember that pictures are not to take the place of explanations! This homework is worth 5 regular assignments. ***Only the very best and most complete responses should expect pluses.***

I A) Explain *everything there is to know* about $a, b, c,$ and d in : a **Fctn ($bx - c$) $+ d$.**

B) Explain how knowing which intervals on the x-axis correspond to which quadrants on the unit circle helps in drawing the graph of *any* trig function. Explain what the "argument" is. Explain how we determine the NEW period length.

C) Explain what a "generic" picture is and how we use it. Explain how the "asymptote method" and the "zeros method" are similar and how they are different and when you and why you would use each to assist in drawing the graph of a trig function.

D) Explain, in words, how to properly graph the function: $A(x) = 2\sin\left(\frac{2}{3}x - \frac{\pi}{6}\right)$

E) Draw the graph of $f(x)$. Be sure your method is VERY clear to Horatio (and me). On each picture, select 1 point on the graph which is not on an axis and estimate the (x, y) coordinate.
Compute $f($ of that x-value). Your estimate and your computed value should be very close.

   1) $f(x) = 2\sin x + \cos x$ 2) $f(x) = 2\sin x \cos x$ 3) $f(x) = \sqrt{\sin^2 4x + \cos^2 4x}$

   4) $f(x) = \cos\frac{1}{2}x + 2\sin\frac{3}{2}x$ 5) $f(x) = \csc^2 x - \cot^2 x$

II A) Explain what "omega" is. Explain what " rho " is.

B) Explain the difference between rotational , linear, and angular velocities.

C) Explain ***EVERYTHING*** there is to know about two points traveling around a non-unit circle at different speeds (and directions) .

D) p_1 starts at (3, 0) and p_2 starts at $\left(\frac{3\sqrt{3}}{2}, \frac{3}{2}\right)$, $\omega_1 = -\frac{\pi}{3}$ and $\omega_2 = -\frac{\pi}{4}$.

   1) When will the two points coincide for the first time after $t = 0$? Use ω_1 to compute the coordinates for that first meeting. Next use ω_2 to compute the coordinates. They are the same point aren't they?

   2) When AND where will the two points coincide for the **third** time after $t = 0$?

III Close your phone call from Horatio with a "Thank you." because now **you** are ready for your 3 trig exam.