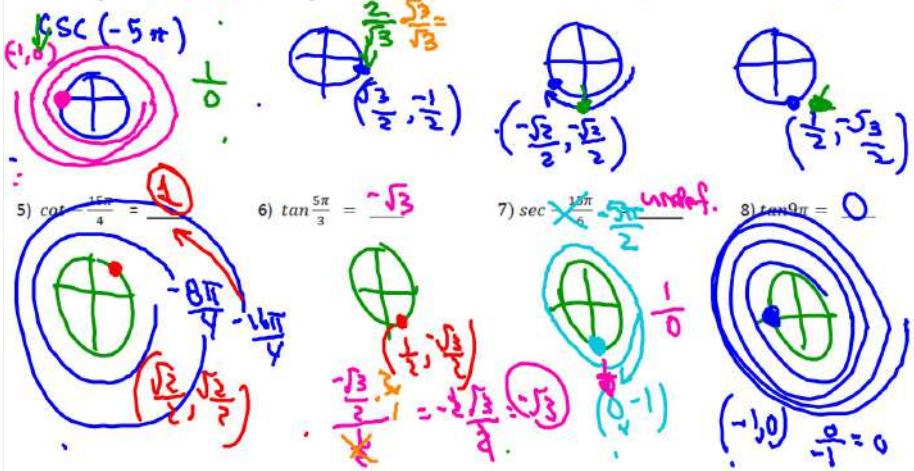
PRE-CALCULUS MID-YEAR EXAM REVIEW - Winter 2017

Unit 1: Intro to Trigonometry

Evaluate the following:

1) $csc -\frac{15\pi}{3}$ = undef. 2) $sec\frac{11\pi}{6}$ = $\frac{2\sqrt{3}}{3}$ 3) $sin(-135°)$ = $\frac{-\sqrt{2}}{2}$ 4) $cos300°$ = $\frac{1}{2}$



5) $cot\frac{15\pi}{4}$ = 1 6) $tan\frac{5\pi}{3}$ = $-\sqrt{3}$ 7) $sec\frac{15\pi}{6}$ = undef. 8) $tan9\pi$ = 0

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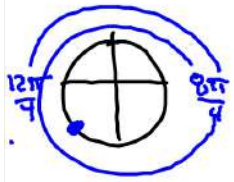
9) Find the following for $\frac{13\pi}{4}$:

a) a reference angle $\frac{\pi}{4}$

b) a positive co-terminal angle $\frac{5\pi}{4}$

c) a negative co-terminal angle $\frac{-3\pi}{4}$

d) quadrant it falls in III



Unit 2: TRIG FUNCTIONS

$y = a\sin(bx+c)+d$

$y = a\cos(bx+c)+d$

$y = a\tan(bx+c)+d$

$Period = \frac{parent's\ \ period}{b}$

$Phase\ Shift = \frac{-c}{b}$

You must know:

(+) • Sine & cosine periods: $\frac{2\pi}{b}$

(+) • tangent period: $\frac{\pi}{b}$

(+) • frequency = $\frac{1}{period}$

(+) • amplitude = $|a|$

• midline $y=d$

• V.S. = d

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Unit 2: Trigonometric Functions

$y = -3\sin\left(\frac{x}{4} - \frac{3\pi}{2}\right) + 2$

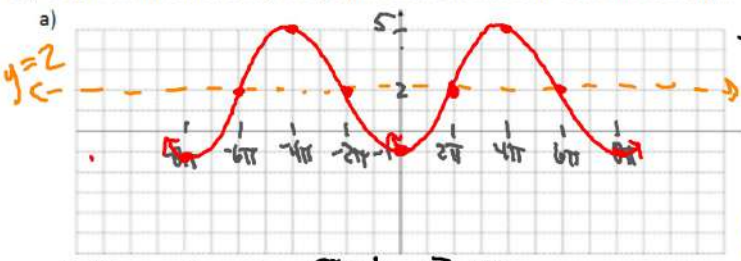
Use the following function to answer the following for #10 - #11: $f(x) = -3\sin\left(\frac{1}{4}x - \frac{3\pi}{2}\right) + 2$

10) Amplitude: 3 Period: 8π Frequency: $\frac{1}{8\pi}$ Phase Shift: 6π

Midline: $y = 2$ Distance between each critical point: 2π

11) Graph the function using the graph below and find the domain and range:

a)



x	y
0	-1
2π	2

b) Domain: $(-\infty, \infty)$

c) Range: $[-1, 5]$

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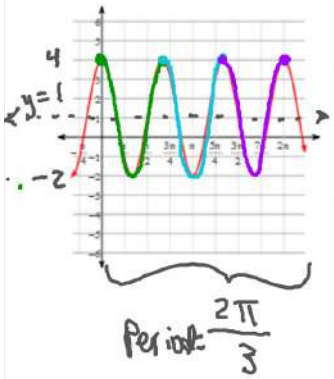
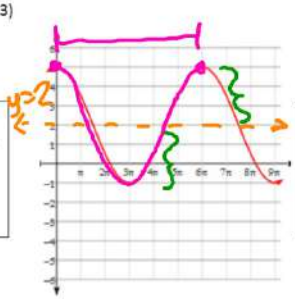
Find the amplitude, period and vertical shift of the following for #12 - #15

12)



Amp: 3
Period: 2π/w
VS: 1

13)



Amp: 3
Period: 6π
VS: 2

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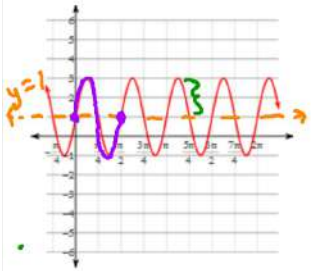
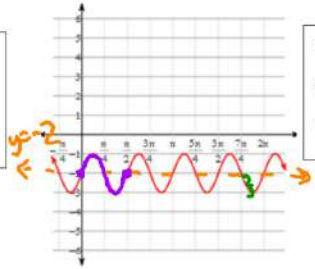
Find the amplitude, period and vertical shift of the following for #12 - #15

14)



Amp: 2
Period: π/2
VS: 1

15)



Amp: 1
Period: π/2
VS: -2

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16) *Real – World Phenomena (Sin/Cos functions)*- The average monthly temperature in Baltimore, Maryland can be described as $T = 22.5\cos\left(\frac{\pi}{6}m - \frac{7\pi}{6}\right) + 54.5$ where m represents the month of the year, January = 1, and T represents temperature.

$\frac{2\pi}{\frac{\pi}{6}} \cdot \frac{6}{\pi} = \frac{12\pi}{\pi} = 12$

a) What is the period of the function? _____

b) According to the model, approximately what month will Baltimore reach about 50°? _____

c) According to the model, what month will Baltimore reach its hottest temperature? _____

d) According to the model, how warm will Baltimore get in a typical year? _____

Calc. SK: 1/5

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+/- any #

17) Write an equation of the sine function with period $\frac{\pi}{3}$, phase shift $-\frac{\pi}{4}$, and vertical shift up 2.

$y = \sin(6x + \frac{3\pi}{2}) + 2$

Period

$\frac{2\pi}{6} = \frac{\pi}{3}$

$6\pi = 6\pi$

$6 = 6$

PS

$6 \cdot \frac{-c}{6} = \frac{-\pi}{4} \cdot 6$

$-c = -\frac{6\pi}{4}$

$c = \frac{6\pi}{4} \rightarrow c = \frac{3\pi}{2}$