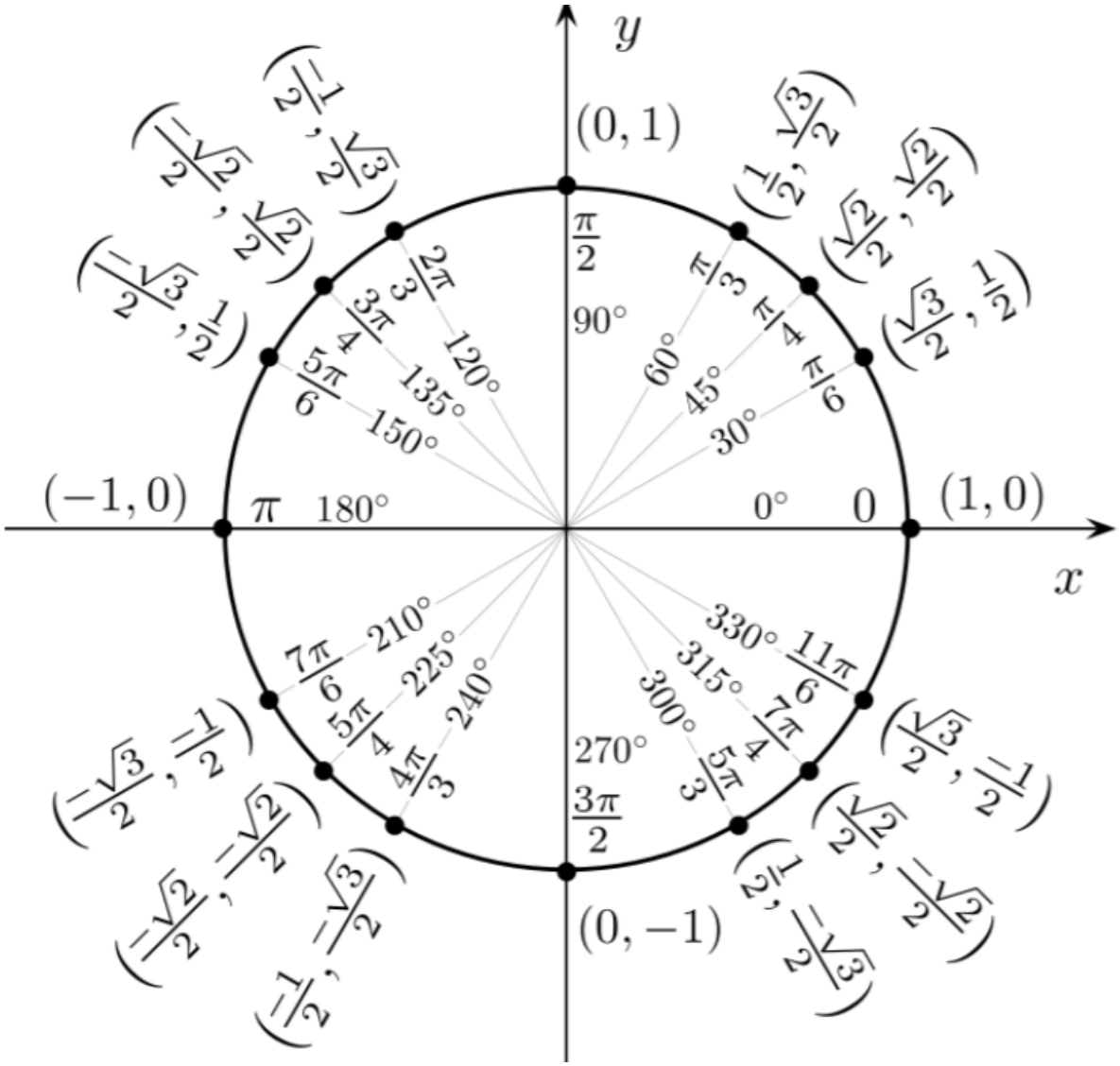
MA 115 Exam 3(A) Name:

1. Please complete the unit circle:
Meaning Put In all coordinates, degrees, and radians



2. List the three Pythagorean Identities:
    1. $\sin^2(x) + \cos^2(x) = 1$
    2. $\tan^2(x) + 1 = sec^2(x)$
    3. $1 + \csc^2(x) = \cot^2(x)$

3. Give a function equivalent to what is given:

a) $\sin(-x) = -\sin(x)$

b) $\cot(x - \frac{\pi}{2}) = -\tan(x)$

4. Evaluate Exactly, without decimals: (If Undefined, write: UND)

a) $\sin(\frac{17\pi}{2}) = 1$

b) $\cos(-315°) = \frac{\sqrt{2}}{2}$

c) $\cos^{-1}(\frac{\sqrt{3}}{2}) = \frac{\pi}{6}$

d) $\tan(420°) = \sqrt{3}$

e) $\arctan(1) = \frac{\pi}{4}$

f) $\cot(3\pi) = \text{UND}$

g) $\csc^{-1}(2) = \frac{\pi}{6}$

h) $\sec(\frac{7\pi}{6}) = -\frac{2\sqrt{3}}{3}$

i) $\sin^{-1}(0) = 0$

j) $\tan(\frac{11\pi}{6}) = \frac{\sqrt{3}}{3}$

k) $\text{arccot}(-1) = \frac{3\pi}{4}$

l) $\sec^{-1}(0) = \text{UND}$

5. What is $\sin(\tan^{-1}(x))$?

$\theta = \tan^{-1}(x)$
$\tan(\theta) = \tan(\tan^{-1}(x))$
$\tan(\theta) = x$
Adjacent side $= 1$, Opposite Side $= x$
Find the Hypotenuse:
$(\text{Hyp})^2 = x^2 + 1^2$
$(\text{Hyp}) = \sqrt{x^2 + 1}$
$\sin(\cot^{-1}(x)) = \sin(\theta) = \frac{\text{Opposite Side}}{\text{Hypotenuse}} = \frac{x}{\sqrt{x^2 + 1}}$

6. For The following, write the letter of the graph corresponding to its equation.

a) $y = \cos(x)$ D

b) $y = 2\sin(\frac{5}{6}x)$ F

c) $y = -\cos(x - \frac{5\pi}{4}) + 1$ C

d) $y = \frac{1}{2}\sin(2x) + \frac{1}{2}$ E

e) $y = \frac{2}{3}\cos(x + \frac{3\pi}{4}) - 1$ A

f) $y = -\frac{1}{3}\sin(3(x + \frac{\pi}{3}))$ B

7. State the Period, Amplitude and all Shifts(as well as their direction) of the following functions:

a) $y = 12\cos(\frac{3\pi}{8}x) + 3$

Amplitude: 12

Period: $\frac{16}{3}$

Vertical Shift: Up 3

Phase Shift: None

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

Amplitude: $\frac{2}{3}$

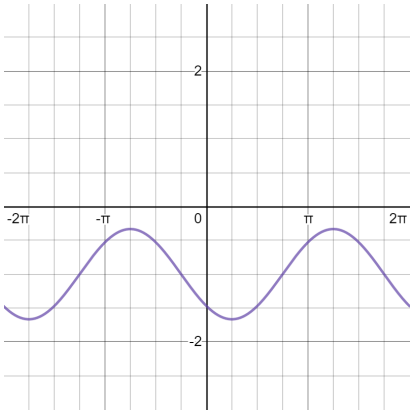
Period: 2π

Vertical Shift: Down 2

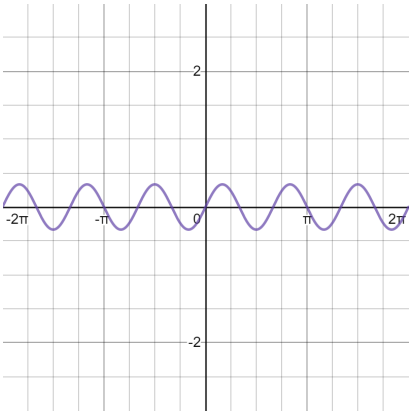
Phase Shift: $\frac{\pi}{3}$ to the left

GRAPHS For #6

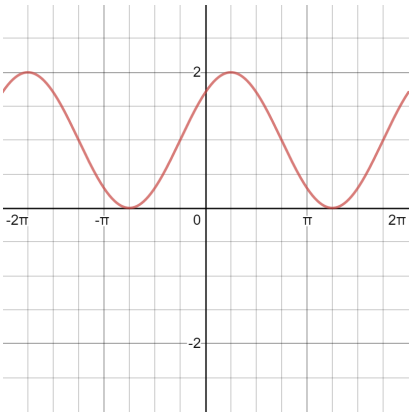
A)



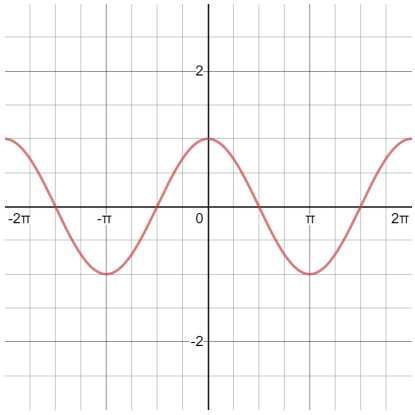
B)



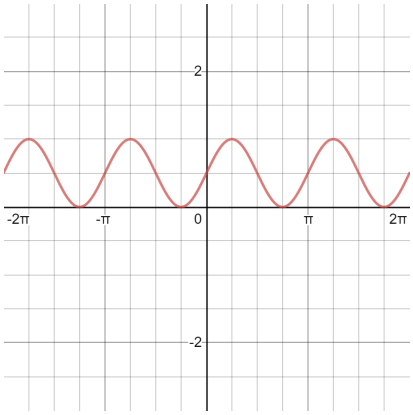
C)



D)



E)



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