1. Write down the limit definition for a function, f(x), having a horizontal asymptote at the line y =b. Explain your reasoning.

$$\lim_{x \to \infty} f(x) = b$$

$$\lim_{x \to -\infty} f(x) = b$$

For either of these two limits, this means that when x approaches $-\infty$ *or* ∞, f(x) approaches b.

2. What does it mean for two angles to be coterminal?

The angles begin and end in the same place, but they are not the same angle

3. List two angles that are coterminal to $\frac{5\pi}{3}$

$\frac{5\pi}{3} + 2\pi$ (once around unit circle)

$\frac{5\pi}{3} + 4\pi$ (twice around unit circle)

4. Find the exact value of each of the following.

i. $arcsin(\frac{\sqrt{3}}{2})$

$\frac{\pi}{3}$

ii. $arccos(cos(0))$

0

iii. $arccos(cos(\pi))$

π

iv. $arcsin(-\frac{\sqrt{3}}{2})$

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

v. $arccos(1)$

0

vi. $sin(arccos(-\ 1))$

0

5. What is the restricted range for inverse sine? For inverse cosine? For inverse tangent?

The range of arcsin(x) is
$[\frac{-\pi}{2}, \frac{\pi}{2}]$. $The\ range\ of\ arccos(x)\ is\ [0, \pi]$. $The\ range\ of\ arctan(x)\ =\ (\frac{-\pi}{2}, \frac{\pi}{2})$

6. Consider the function $f(x)\ =\ \frac{1}{x^2-9}$
   a. What is the domain of f(x)? Write the domain in interval notation

$(-\ \infty,\ -\ 3)\ \cup\ (-\ 3, 3)\ \cup\ (3, \infty)$

   b. What are the x- and y- intercepts of f(x)?

$No\ x\ -\ intercepts$
Y-intercept: $(0,\ \frac{-1}{9})$

   c. List the limits that you need to evaluate in order to determine the end behavior of this function.

$\lim_{x \to \infty} f(x)$

$\lim_{x \to \infty} f(x)$

   d. Which of the limits in part (c) can tell you whether the function has a horizontal asymptote? Evaluate these limits.

Y = 0

7. Determine the following limits.

   a. $\lim_{x \to -4^-} \frac{x}{x+4}$

∞

   b. $\lim_{x \to 1+} \frac{x^2+2x-3}{x^2-x}$

4

   c. $\lim_{x \to 3} \frac{3}{x-3}$

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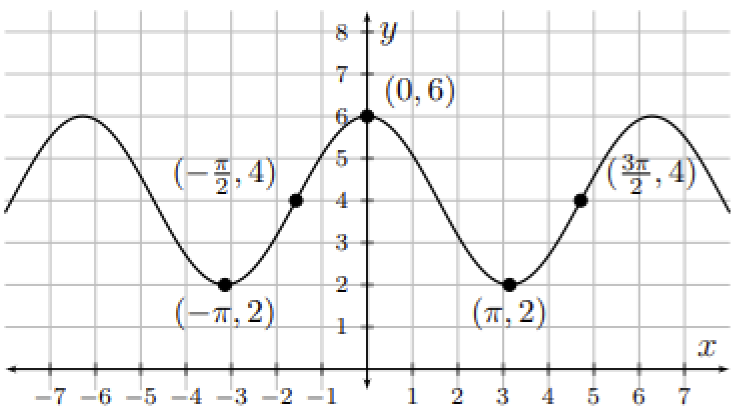
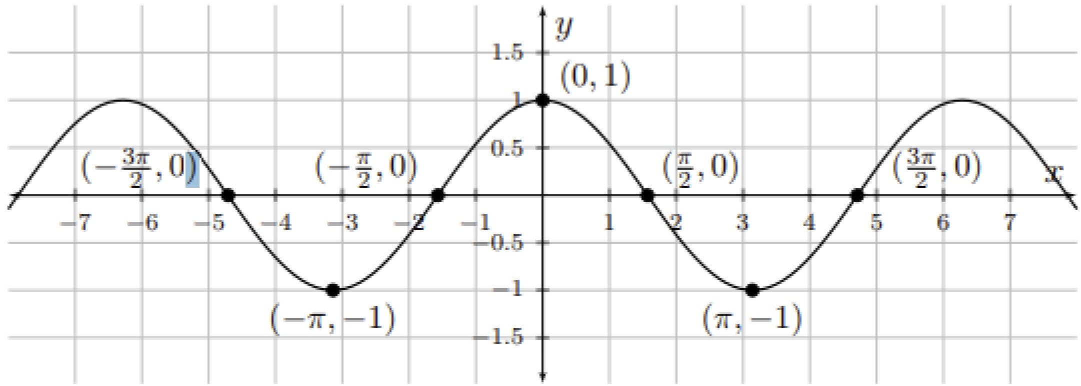
8. Use transformations to put two cycles/periods of the following functions. Describe each transformation in words.

   a. $f(x) = 2cos(x) + 4$



   b. $g(x) = -sin(x - \frac{\pi}{2})$


y
x
1.5
1
0.5
−0.5
−1
−1.5
−7
−6
−5
−4
−3
−2
−1
1
2
3
4
5
6
7
(0, 1)
(−3π/2, 0)
(−π/2, 0)
(π/2, 0)
(3π/2, 0)
(−π, −1)
(π, −1)