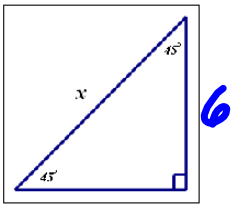
1) **Special Right Triangles:** (3 points) Find the value of x in the triangle below.



$X = 6\sqrt{2}$

SPECIAL RIGHT TRIANGLE.

ANY SIDE COULD BE GIVEN.

2) **Section 13.3** (4 points) Convert each degree measure to radians. If given in radians, convert to degrees. Leave answers in terms of π (when appropriate).

a) 15°

b) $\frac{-3\pi}{4}$

c) -315°

d) $\frac{13\pi}{6}$

a) $15^\circ = 15^\circ\left(\frac{\pi}{180^\circ}\right) = \frac{\pi}{12}$

b) $\frac{-3\pi}{4} = \frac{-3\pi}{4}\left(\frac{180^\circ}{\pi}\right) = -3(45^\circ)$

$= -135^\circ$

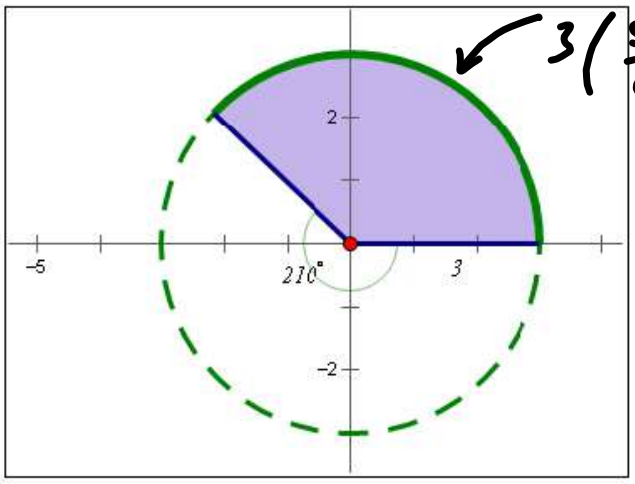
c) $-315^\circ = -315^\circ\left(\frac{\pi}{180^\circ}\right) = \frac{-315\pi}{180}$

$= -\frac{63\pi}{36} = -\frac{7\pi}{4}$

d) $\frac{13\pi}{6} = \frac{13\pi}{6}\left(\frac{180^\circ}{\pi}\right) = 13(30^\circ)$

$= 390^\circ$

3) **Section 13.3** (4 points) Find the perimeter of the sector shaded below.



$3\left(\frac{5\pi}{6}\right) = \frac{5\pi}{2}$

$S = r\theta$

↑ MUST BE IN RADIANS

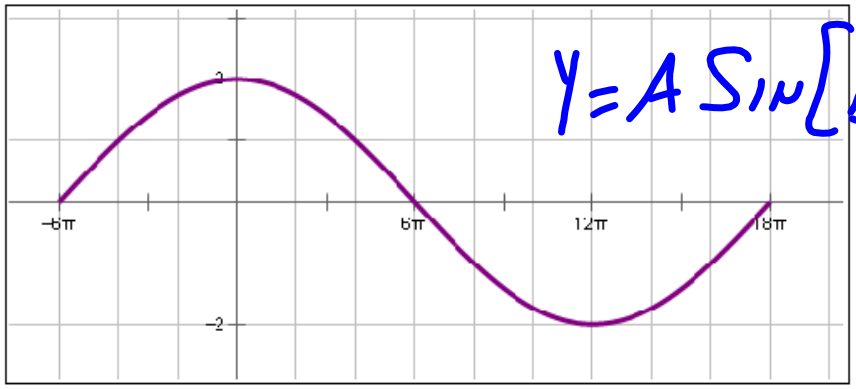
$150^\circ = \frac{5\pi}{6}$ RADIANS

$\text{PERIMETER} = 3 + 3 + \frac{5\pi}{2}$

$= 6 + \frac{5\pi}{2} = \frac{12 + 5\pi}{2}$

OR

$2\pi(3)\left(\frac{150}{360}\right) + 6$



$y = A\sin[B(x+c)] + D$

4) **Section 13.7** (6 points) Give the amplitude, period, and an equation (using sine) for the curve above.

PERIOD $= 24\pi$

$P = \frac{2\pi}{B}$

$24\pi = \frac{2\pi}{B}$

$24\pi B = 2\pi$

$B = \frac{2\pi}{24\pi} = \frac{1}{12}$

AMP: 2

SHIFT: LEFT 6π

DOWN 0

$y = A\sin[B(x+c)] + D$

$y = 2\sin\left[\frac{1}{12}(x+6\pi)\right] + 0$

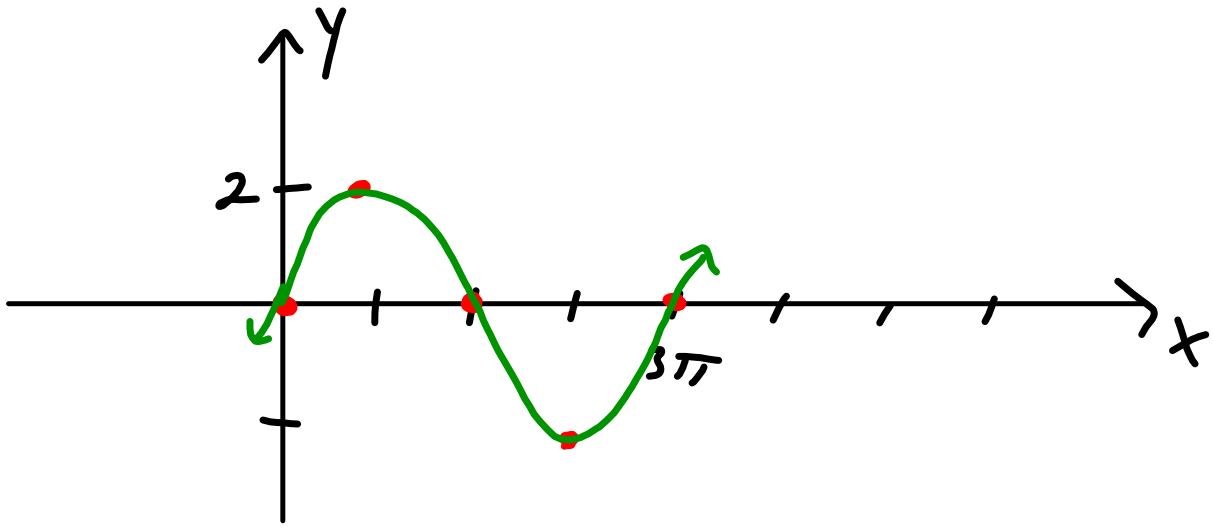
$y = 2\sin\left[\frac{1}{12}x + \frac{\pi}{2}\right]$

5) **Section 13.4** (6 points) Find the period and amplitude of the equation given below. Then graph the function.

$$f(x) = 2\sin\left(\frac{2}{3}x\right)$$

$$P = \frac{2\pi}{\frac{2}{3}} = 2\pi\left(\frac{3}{2}\right) = 3\pi$$

$$Amp = 2$$



6) **Section 13.5** (6 points) Identify the period, amplitude, domain, and range of the function given below. Then graph the function.

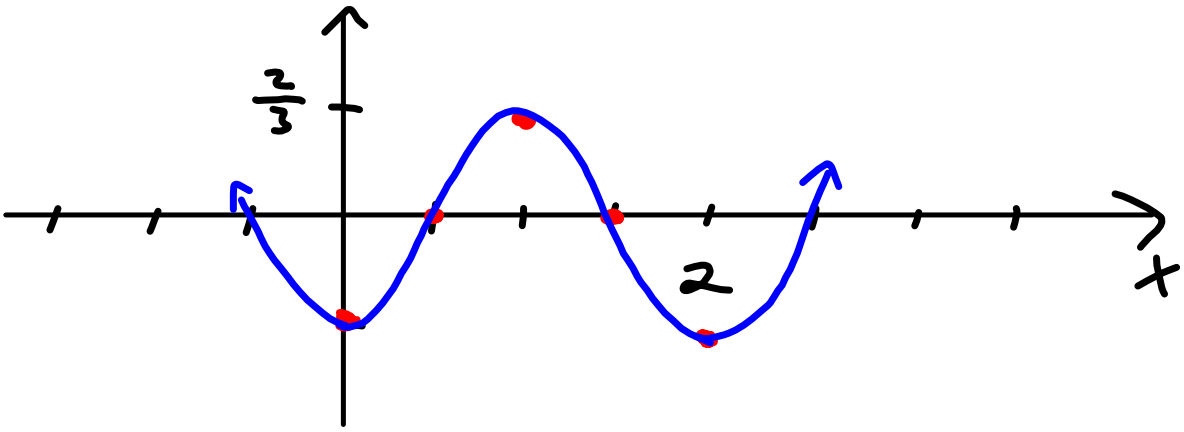
$$f(x) = \frac{-2}{3}\cos(\pi x)$$

PERIOD $= \frac{2\pi}{\pi} = 2$

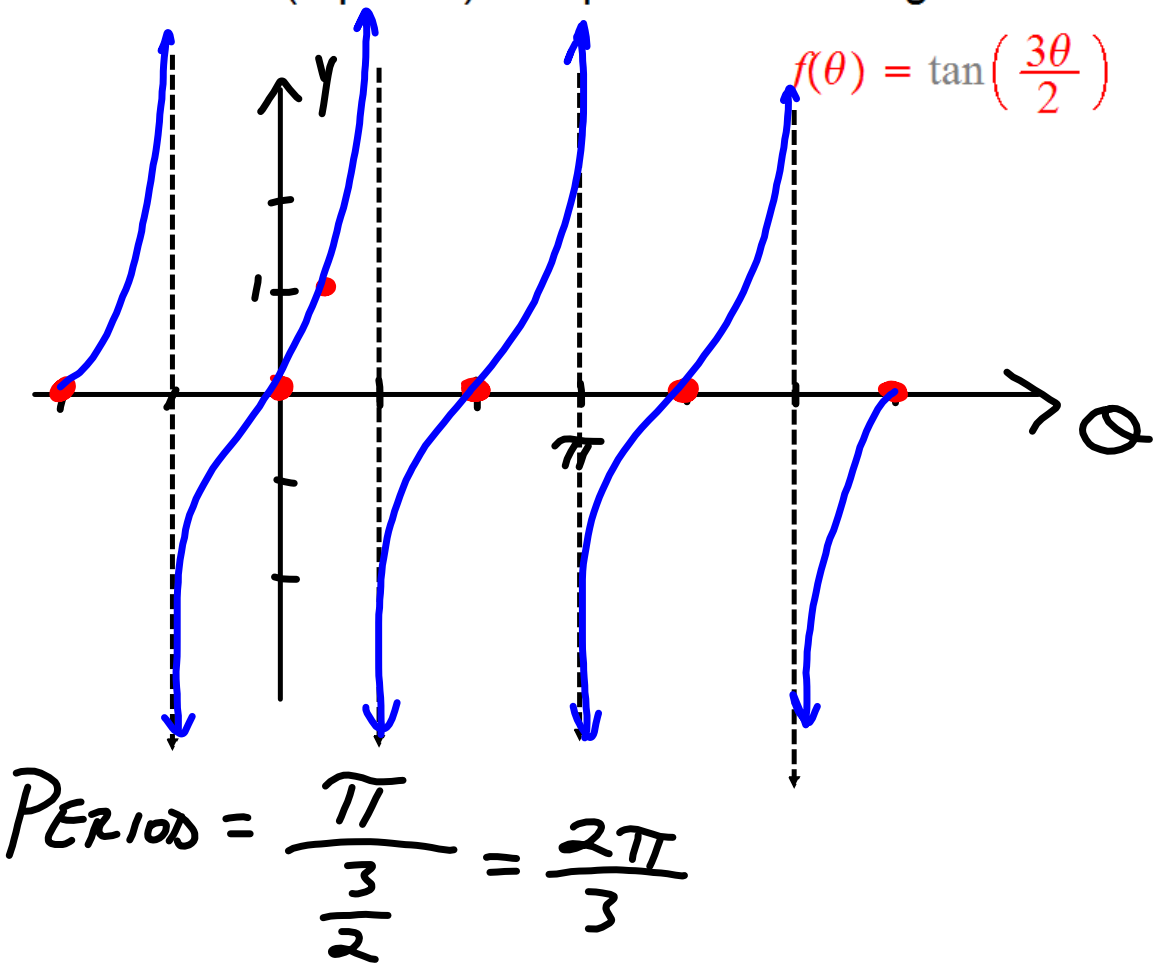
AMP: $\frac{2}{3}$

DOMAIN: ALL REALS

RANGE: $-\frac{2}{3} \leq y \leq \frac{2}{3}$



7) **Section 13.6** (6 points) Graph the function given below.



$$\text{PERIOD} = \frac{\pi}{\frac{3}{2}} = \frac{2\pi}{3}$$

8) **Section 13.7** (10 points) Sketch the graph of the equation given below.

$$y + 3 = 6\sin\left[\frac{\pi x}{4} + \frac{\pi}{2}\right]$$

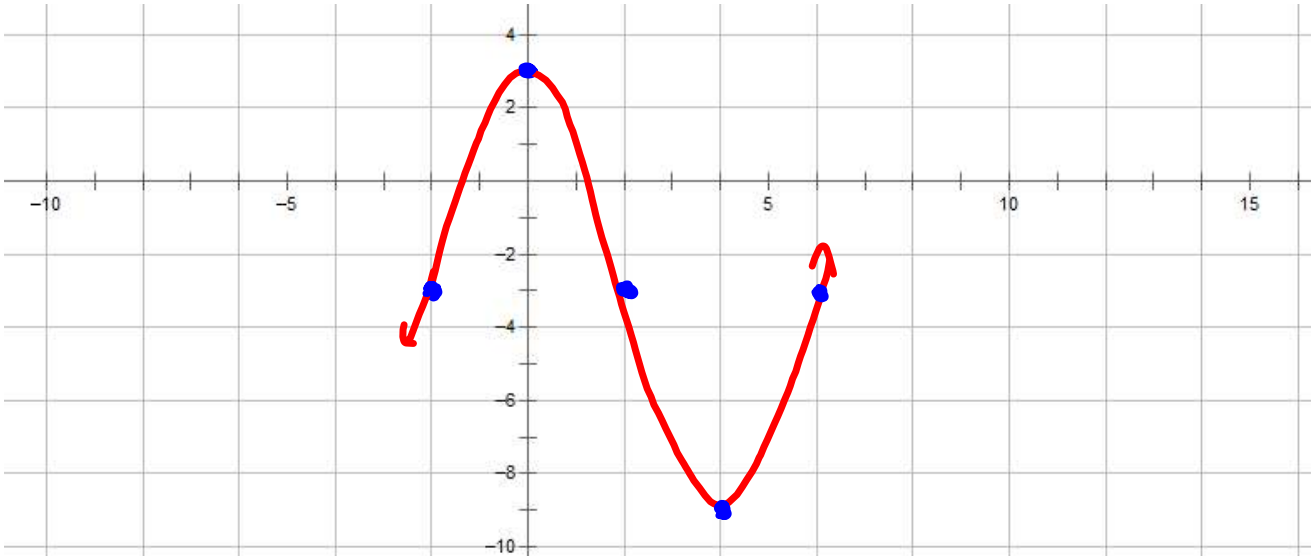
$$y = 6\sin\left[\frac{\pi}{4}(x+2)\right] - 3$$

$$\text{PERIOD} = \frac{2\pi}{\frac{\pi}{4}} = 2\pi\left(\frac{4}{\pi}\right) = 8$$

SHIFT

LEFT 2

DOWN 3

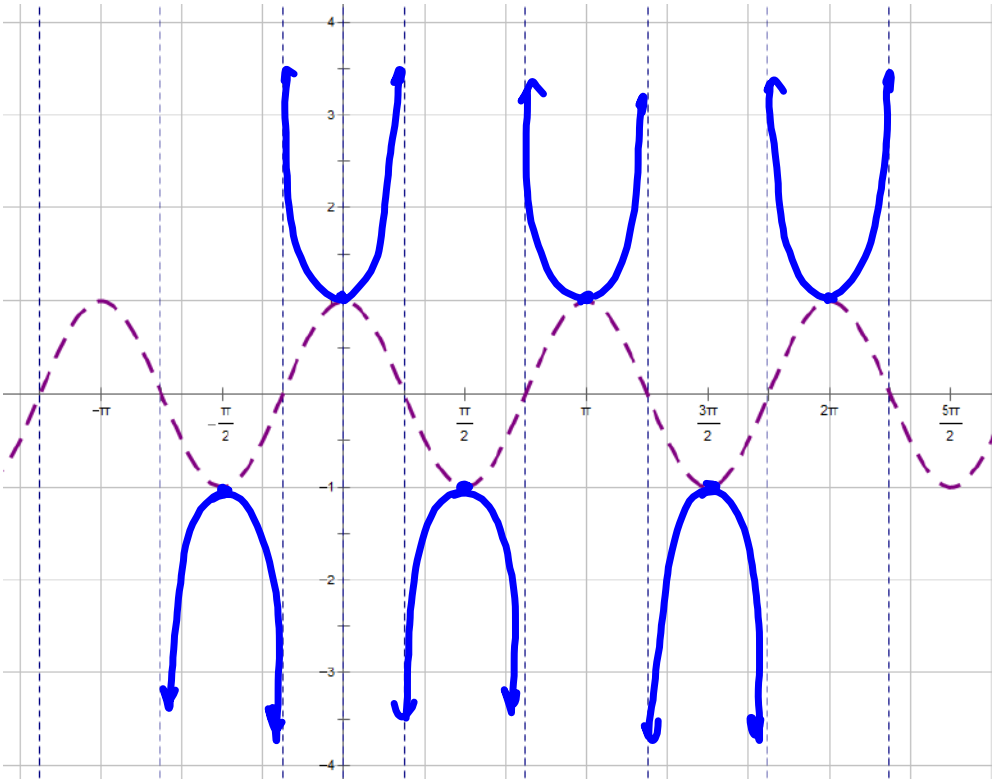


9) **Section 13.8** (6 points) Graph the function below. The problem could be any reciprocal function $(\sec(x), \csc(x), \cot(x))$

$$f(x) = \sec(2x)$$

First, Graph the Reciprocal Function $y = \cos(2x)$.

Draw Asymptotes where $y = \cos(2x)$ is 0.



$y = \cos(2x)$

Period: $\frac{2\pi}{2} = \pi$

Amplitude: 1

10) **Sections 13.2,**(8 points) Find the value of the expressions below.

a) $\sin\frac{2\pi}{3}$

b) $\cos(-\frac{\pi}{2})$

c) $\cos 315°$

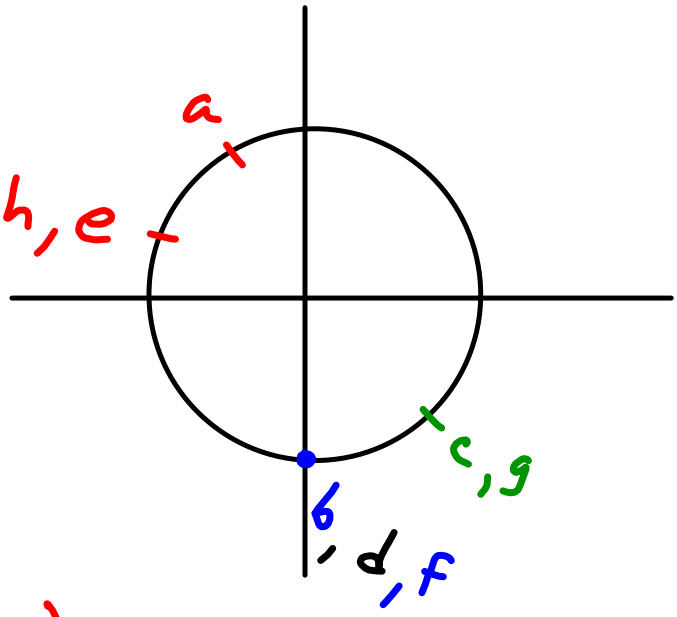
d) $\sin(-450°)$

e) $\tan\frac{5\pi}{6}$

f) $\csc(-\frac{5\pi}{2})$

g) $\cot 315°$

h) $\sec(-210°)$



a) $\frac{\sqrt{3}}{2}$

b) 0

c) $\frac{\sqrt{2}}{2}$

d) -1

e) $\frac{\frac{1}{2}}{\frac{-\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$

f) -1

g) $\frac{\frac{\sqrt{2}}{2}}{\frac{-\sqrt{2}}{2}} = -1$

h) $\frac{-2}{\sqrt{3}} = \frac{-2\sqrt{3}}{3}$