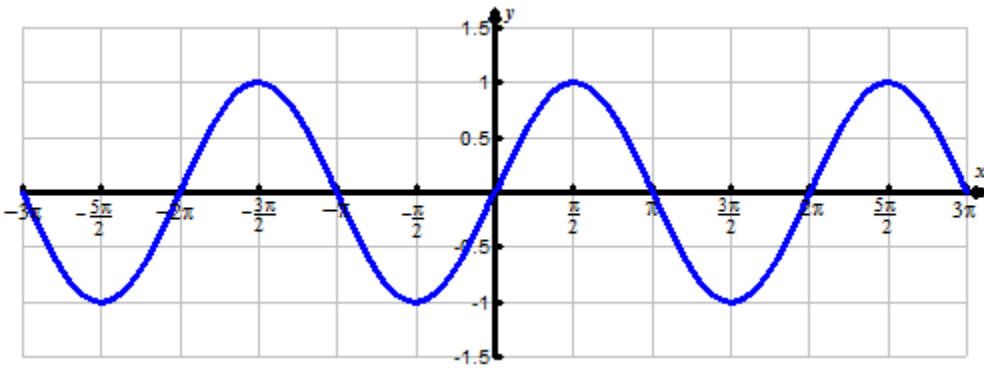


**Sec 3.3 – Basic Trigonometric Equations  
Inverses of Trigonometric Functions**

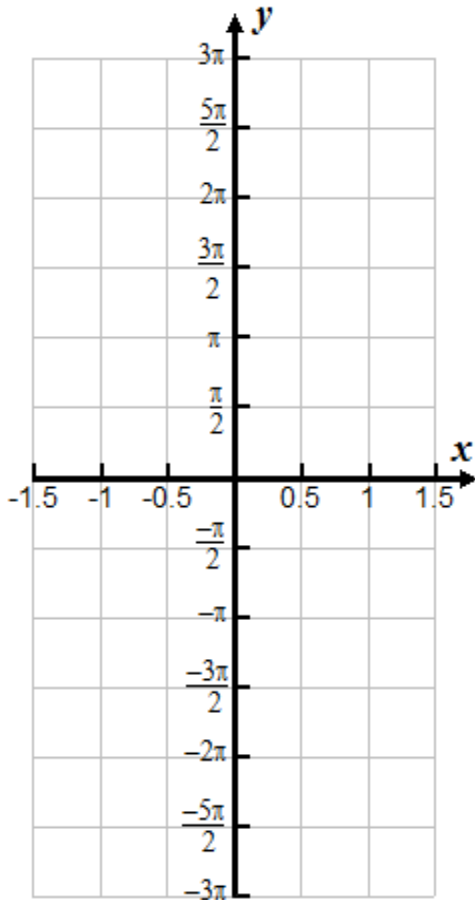
Name: \_\_\_\_\_

Consider the graph of the function  $f(x) = \sin(x)$  shown below.



$x$	$y$
$-2\pi$	0
$-\frac{3\pi}{2}$	1
$-\pi$	0
$-\frac{\pi}{2}$	-1
0	0
$\frac{\pi}{2}$	1
$\pi$	0
$\frac{3\pi}{2}$	-1
$2\pi$	0

Using coordinate points of the graph to assist you and create a sketch of the inverse of  $f(x) = \sin(x)$ .



$x$	$y$

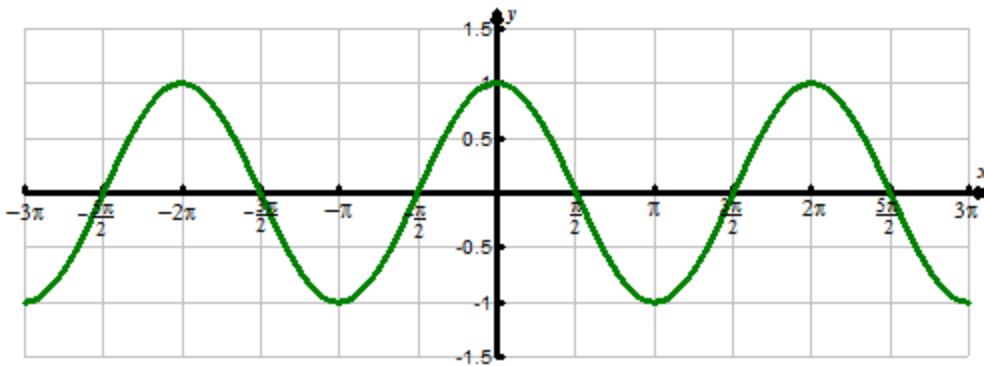
Explain whether or not the complete inverse of  $f(x) = \sin(x)$  is a function. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

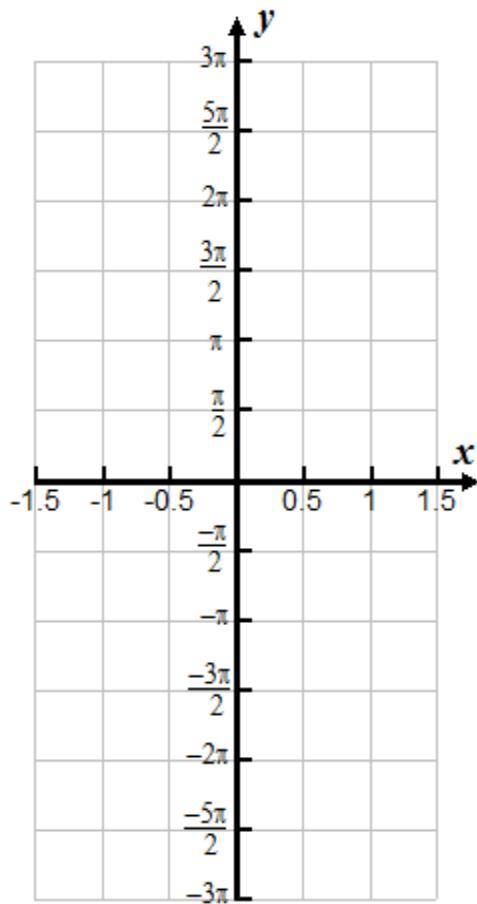
Highlight or emphasize the part of the graph above known as  $f(x) = \text{Sin}^{-1}(x)$

Consider the graph of the function  $f(x) = \cos(x)$  shown below.



$x$	$y$
$-2\pi$	1
$-\frac{3\pi}{2}$	0
$-\pi$	-1
$-\frac{\pi}{2}$	0
0	1
$\frac{\pi}{2}$	0
$\pi$	-1
$\frac{3\pi}{2}$	0
$2\pi$	1

Using coordinate points of the graph to assist you and create a sketch of the inverse of  $f(x) = \cos(x)$ .

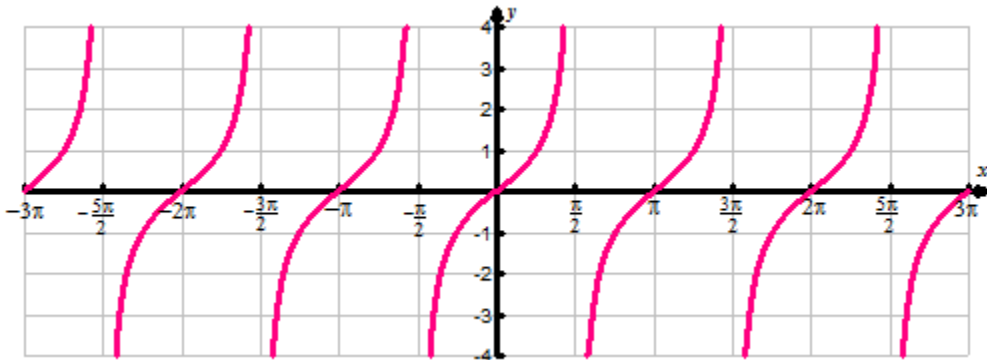


$x$	$y$

Explain whether or not the complete inverse of  $f(x) = \cos(x)$  is a function. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

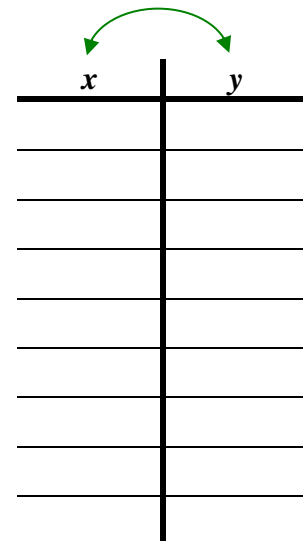
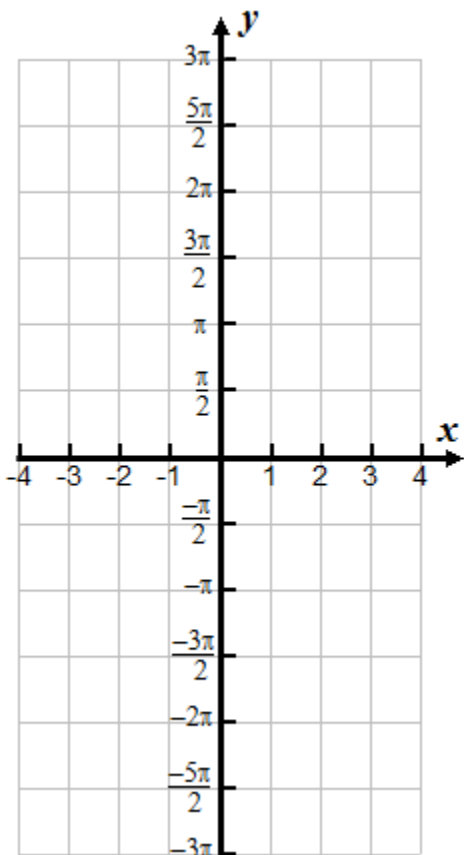
Highlight or emphasize the part of the graph above known as  $f(x) = \text{Cos}^{-1}(x)$

Consider the graph of the function  $f(x) = \tan(x)$  shown below.



$x$	$y$
$-2\pi$	0
$-\frac{3\pi}{2}$	Undefined
$-\pi$	0
$-\frac{\pi}{2}$	Undefined
0	0
$\frac{\pi}{2}$	Undefined
$\pi$	0
$\frac{3\pi}{2}$	Undefined
$2\pi$	0

Using coordinate points of the graph to assist you and create a sketch of the inverse of  $f(x) = \tan(x)$ .



Explain whether or not the complete inverse of  $f(x) = \tan(x)$  is a function. \_\_\_\_\_

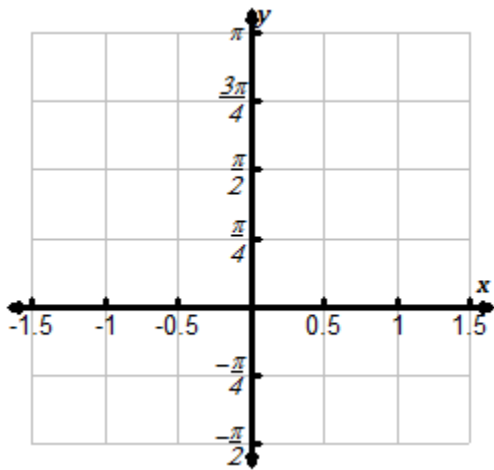
\_\_\_\_\_

\_\_\_\_\_

Highlight or emphasize the part of the graph above known as  $f(x) = \tan^{-1}(x)$

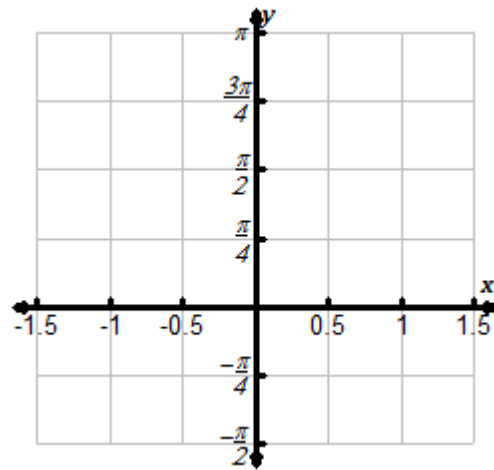
**Sketch a graph of each of the following and answer the questions**

A. Sketch a graph of the function  $f(x) = \text{Sin}^{-1}(x)$



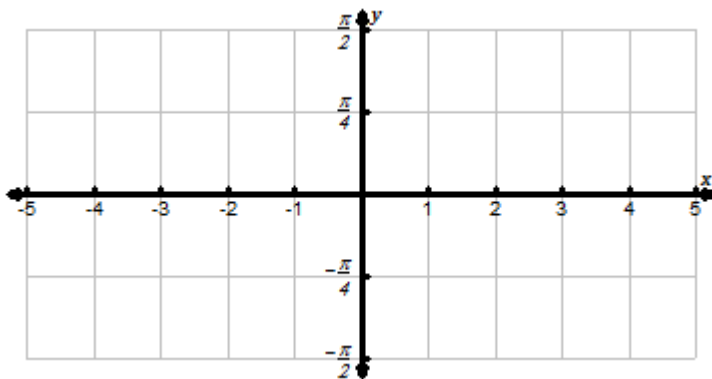
- i) **Minimum:** \_\_\_\_\_
- ii) **Maximum:** \_\_\_\_\_
- iii) Describe the **Domain:** \_\_\_\_\_
- iv) Describe the **Range:** \_\_\_\_\_
- v) Describe **Intervals of Increase:** \_\_\_\_\_
- vi) Describe **Intervals of Decrease:** \_\_\_\_\_
- vii) Determine the **x-intercept:** \_\_\_\_\_
- viii) Determine the **y-intercept:** \_\_\_\_\_

B. Sketch a graph of the function  $f(x) = \text{Cos}^{-1}(x)$



- i) Local **Minimums:** \_\_\_\_\_
- ii) Local **Maximums:** \_\_\_\_\_
- iii) Describe the **Domain:** \_\_\_\_\_
- iv) Describe the **Range:** \_\_\_\_\_
- v) Describe **Intervals of Increase:** \_\_\_\_\_
- vi) Describe **Intervals of Decrease:** \_\_\_\_\_
- vii) Determine the **x-intercept:** \_\_\_\_\_
- viii) Determine the **y-intercept:** \_\_\_\_\_

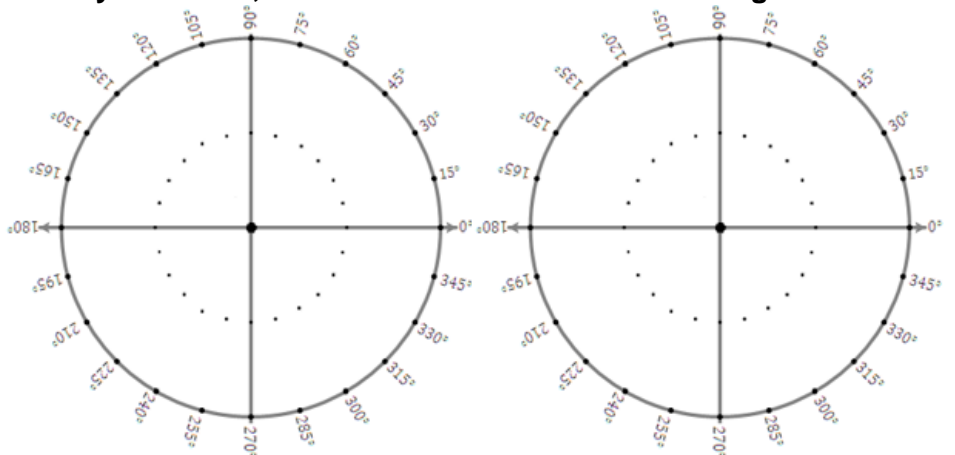
C. Sketch a graph of the function  $f(x) = \text{Tan}^{-1}(x)$



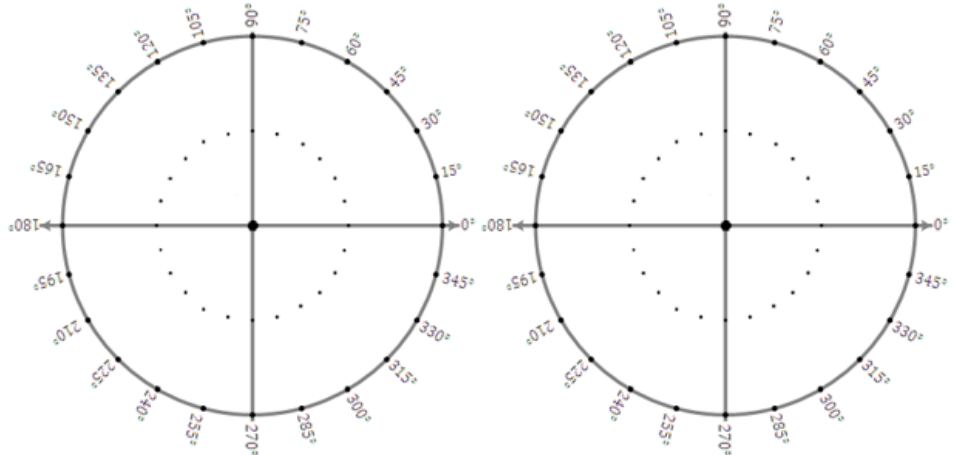
- i) **Minimum:** \_\_\_\_\_
- ii) **Maximum:** \_\_\_\_\_
- iii) Describe the **Domain:** \_\_\_\_\_
- iv) Describe the **Range:** \_\_\_\_\_
- v) Describe **Intervals of Increase:** \_\_\_\_\_
- vi) Describe **Intervals of Decrease:** \_\_\_\_\_
- vii) As  $x \rightarrow \infty$ , determine  $f(x) \rightarrow$  \_\_\_\_\_
- viii) As  $x \rightarrow -\infty$ , determine  $f(x) \rightarrow$  \_\_\_\_\_
- ix) Determine the **x-intercept:** \_\_\_\_\_
- x) Determine the **y-intercept:** \_\_\_\_\_

Using your knowledge of inverse trigonometry functions, determine the value of the following:

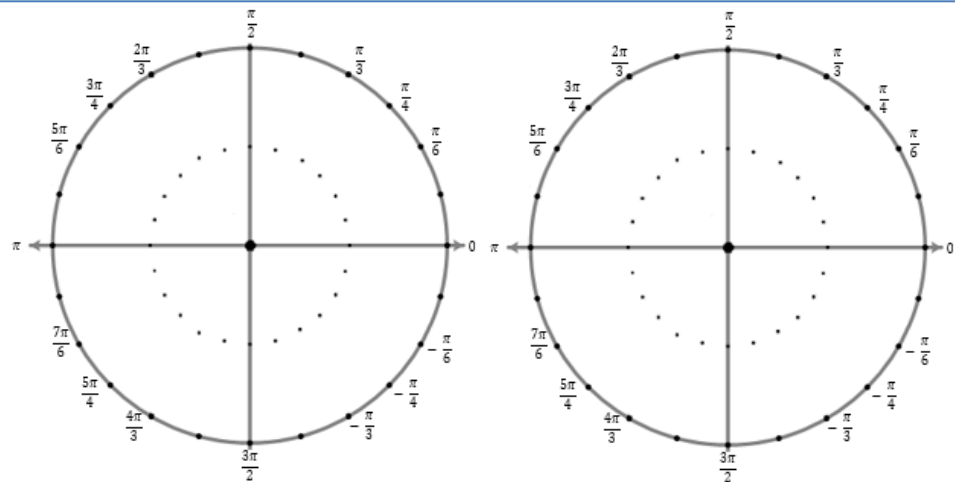
a.  $\text{Sin}^{-1}(\sin(150^\circ)) =$



b.  $\text{Cos}^{-1}(\cos(225^\circ)) =$



c.  $\text{Sin}^{-1}\left(\sin\left(\frac{4\pi}{3}\right)\right) =$



d.  $\text{Tan}^{-1}\left(\tan\left(\frac{5\pi}{6}\right)\right) =$

