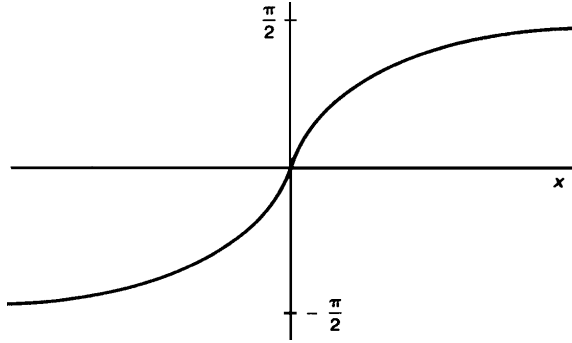


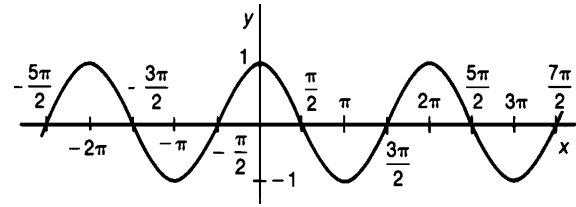
Exercises

1. Below are the graphs of $y = \sin x$, $y = \cos x$, $y = \tan x$ and their respective inverse functions. Match the function with its inverse.

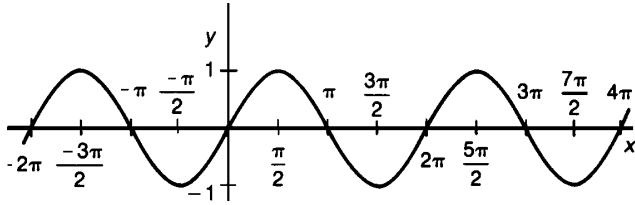
a.



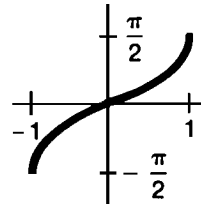
b.



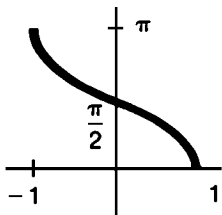
c.



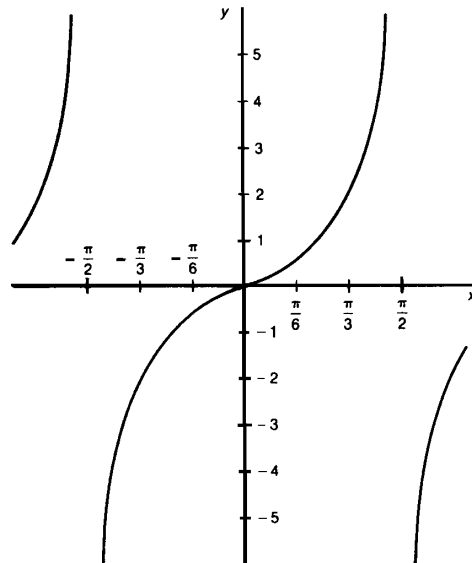
d.



e.



f.



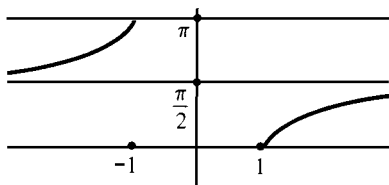
2. What are the values for the following inverse trig functions? Do **not** use a calculator. Remember, there is just **one** value for each of these.

- a. $\sin^{-1} .5$ b. $\tan^{-1} 0$ c. $\cos^{-1} \sqrt{2}/2$
 d. $\tan^{-1} (-1)$ e. $\cos^{-1} (-\sqrt{3}/2)$ f. $\sin^{-1} (-1)$

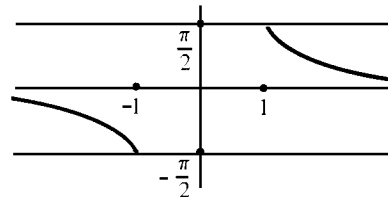
3. Why was there only **one** answer for each of the problems in # 2?

4. Graphed below are $y = \sec^{-1}x$, $y = \csc^{-1}x$ and $y = \tan^{-1}x$. From the graphs state the domain and range of each.

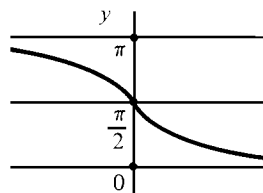
a. $y = \sec^{-1}x$



b. $y = \csc^{-1}x$



c. $y = \cot^{-1}x$



5. What are the values for the following inverse trig functions? Do **not** use a calculator. Remember, there is just **one** value for each of these.

- a. $\sec^{-1} 2$ b. $\csc^{-1} 2/\sqrt{3}$ c. $\cot^{-1} (-\sqrt{3})$
 d. $\csc^{-1} (-1/2)$ e. $\cot^{-1} (-1)$ f. $\sec^{-1} (0)$

6. a. Which inverse trig functions have the same domain?

- b. Which inverse trig functions have the same range?
 - c. Which inverse trig functions' domains are continuous over the real numbers?
 - d. Which inverse trig functions' ranges are continuous over the real numbers?
7. If x stands for all real numbers, explain why $\sin(\sin^{-1} x)$ is not possible but $\sin^{-1}(\sin x)$ is possible.
8. Is $\tan(\tan^{-1}x)$ possible? Explain your answer.
9. When you use a calculator, $y = \sec x$ and $y = \sec^{-1} x$ do not usually have their own special keys. How would you enter each of them on your calculator?
10. Convert the following from rectangular coordinates to polar coordinates or from polar coordinates to rectangular.
- a. (2,2)
 - b. (5,0)
 - c. (0,10)
 - d. (2, 30°)
 - e. (-5, $-\pi/2$)
 - f. (3, 135°)
11. If you have a graphing utility, use it to graph the polar equations which were graphed in the lesson. (Hint: you will need to use **polar** mode and adjust your viewing window!)
12. a. What is refraction?
- b. What is Snell's law and what can you determine when you use it?