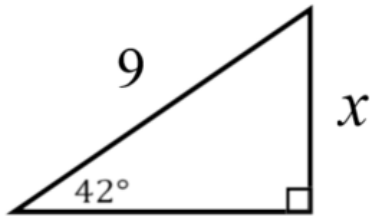
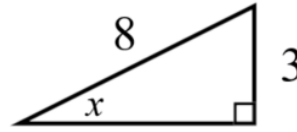


Write your questions and thoughts here!

Find the missing side.



Find the missing angle.



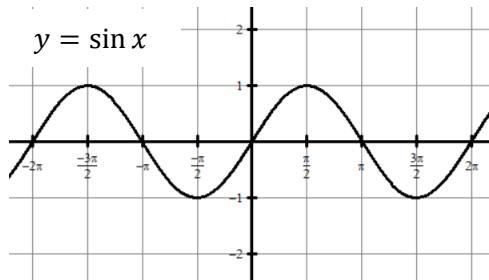
Trig Function

$$f(x) = \sin(x)$$

Domain:

Range:

Graph:



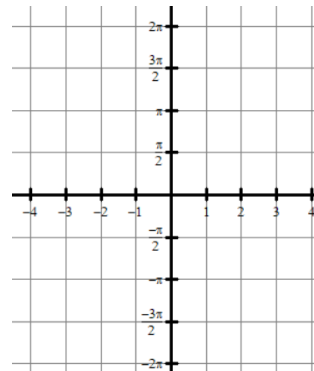
Inverse Trig Function

$$f(x) = \sin^{-1}(x)$$

Domain:

Range:

Graph:

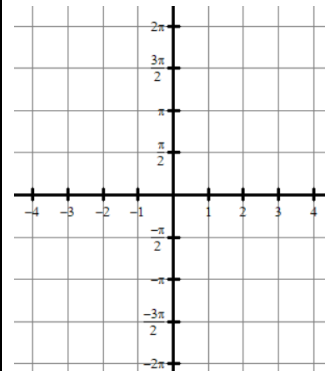


PRINCIPAL VALUES

Domain:

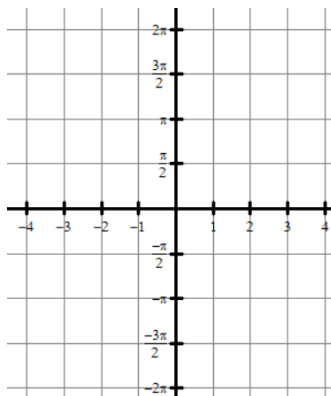
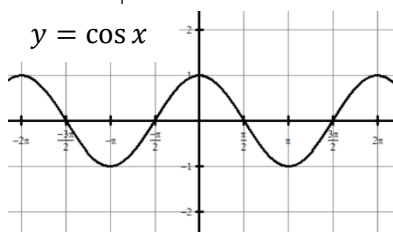
Range:

Graph:



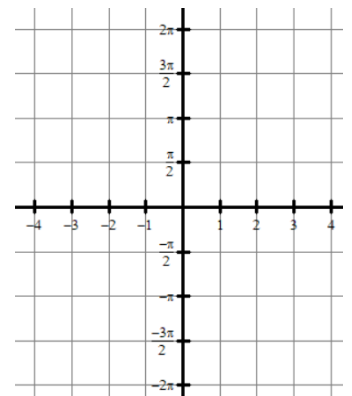
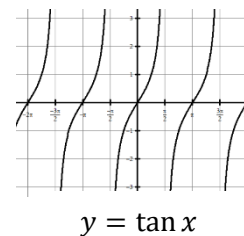
$f(x) = \arccos(x)$

Restricted Domain:



$f(x) = \arctan(x)$

Restricted Domain:

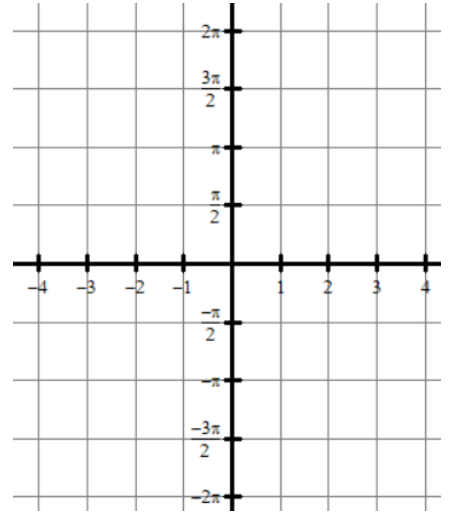


Write your questions
and thoughts here!



Find the inverse of the function. Graph it! State the domain and range of $f^{-1}(x)$.

$$f(x) = 2 \sin x + 1 \text{ for } -\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$$



Evaluate the following expressions. Find the principal value in radians.

$$\sin^{-1}\left(\frac{1}{2}\right)$$

$$\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$$

$$\tan^{-1}(\sqrt{3})$$

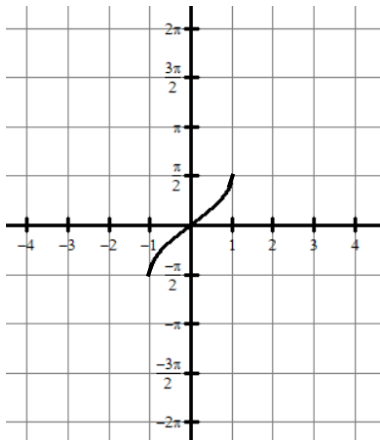
3.9 Inverse Trigonometric Functions

AP Precalculus

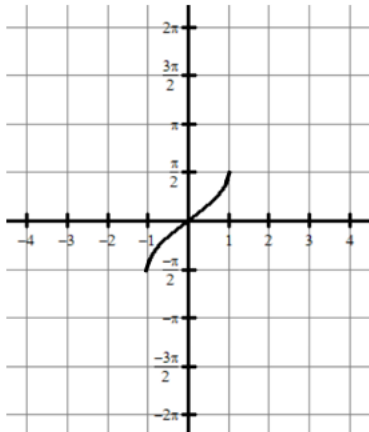
3.9 Practice

The graph of $f(x) = \sin^{-1}(x)$ is shown below. Use the graph of f to graph $g(x)$.

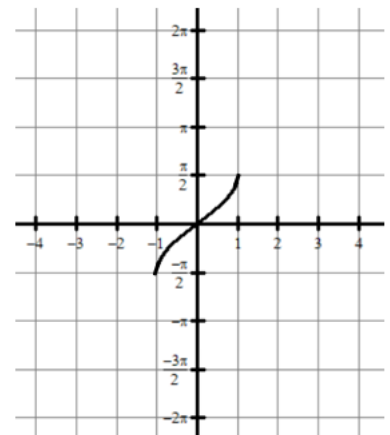
1. $g(x) = 2 \sin^{-1}(x)$



2. $g(x) = 3 \sin^{-1}(x) - \frac{\pi}{2}$

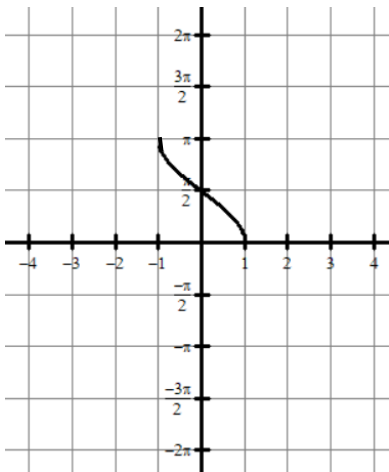


3. $g(x) = \sin^{-1}\left(\frac{1}{3}(x-1)\right)$

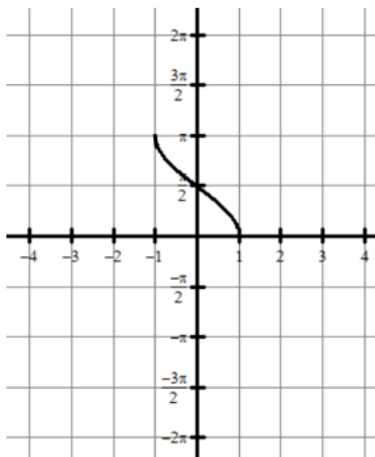


The graph of $f(x) = \cos^{-1}(x)$ is shown below. Use the graph of f to graph $g(x)$.

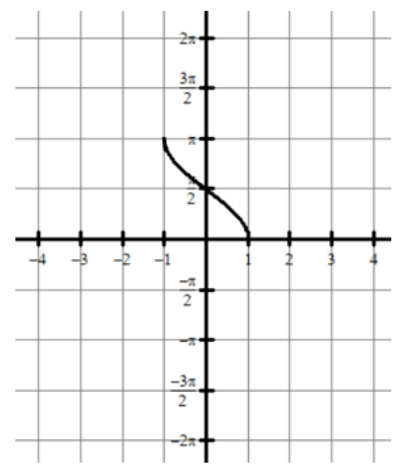
4. $g(x) = 2 \cos^{-1}(x) - \pi$



5. $g(x) = \cos^{-1}(x+2) - \frac{\pi}{2}$

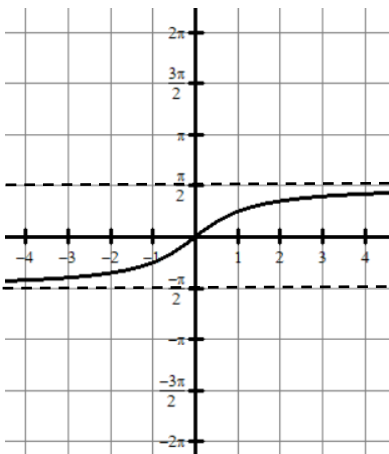


6. $g(x) = 2 \cos^{-1}(-2x)$

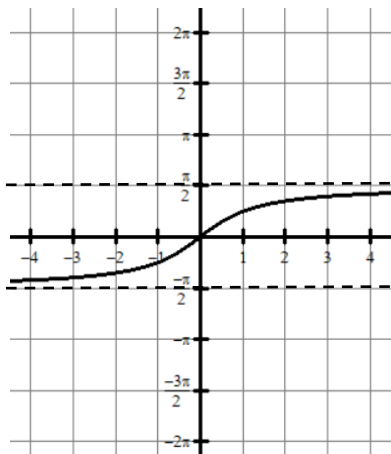


The graph of $f(x) = \tan^{-1}(x)$ is shown below. Use the graph of f to graph $g(x)$.

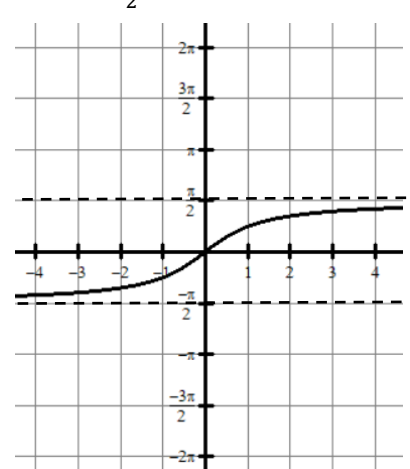
7. $g(x) = 3 \tan^{-1}(x)$



8. $g(x) = 2 \tan^{-1}(x) + \pi$



9. $g(x) = \frac{1}{2} \tan^{-1}(-x) - 3$



Find the inverse of each function and list the domain and range of $f^{-1}(x)$.

10. $f(x) = 5 \sin x - 3$ for $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$

11. $f(\theta) = \frac{1}{2} \tan \theta$ for $-\frac{\pi}{2} < \theta < \frac{\pi}{2}$

12. $f(x) = 4 - \cos(2x)$ for $0 \leq x \leq \frac{\pi}{2}$

13. $f(\theta) = 3 \sin(\theta - \pi) + 1$ for $-\frac{\pi}{2} \leq \theta \leq \frac{\pi}{2}$

Evaluate the following expressions. Find the principal value in radians. NO CALCULATOR!!

14. $\sin^{-1}\left(\frac{1}{2}\right)$

15. $\cos^{-1}\left(\frac{1}{2}\right)$

16. $\tan^{-1}(-1)$

17. $\arccos\left(\frac{\sqrt{3}}{2}\right)$

18. $\arcsin\left(-\frac{\sqrt{2}}{2}\right)$

19. $\tan^{-1}(-\sqrt{3})$

20. $\sin(\theta) = 1$

21. $\sin(\theta) = \frac{\sqrt{3}}{2}$

22. $\cos(\theta) = \frac{\sqrt{3}}{2}$

23. $\tan(\theta) = -\frac{\sqrt{3}}{3}$

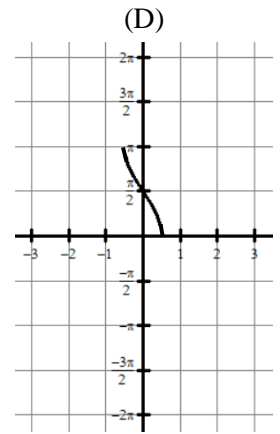
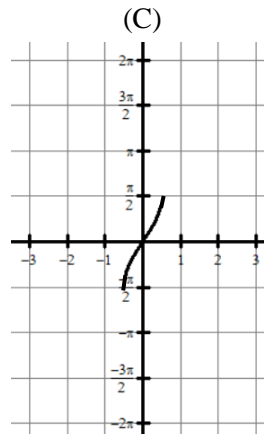
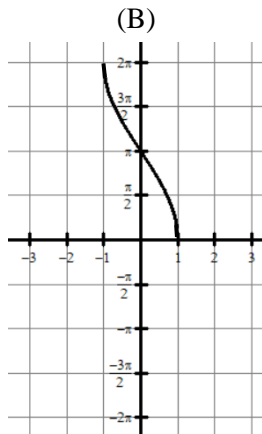
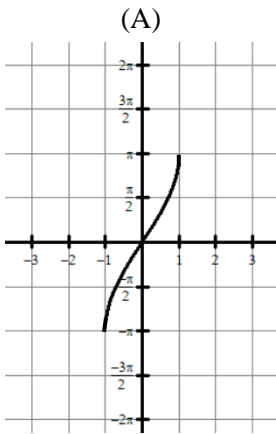
24. $\cos(\theta) = \frac{\sqrt{2}}{2}$

25. $\sin(\theta) = 0$

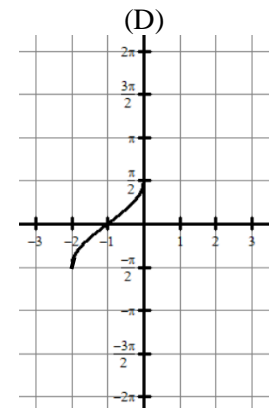
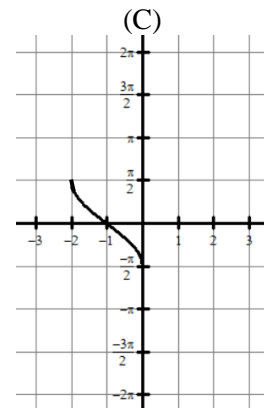
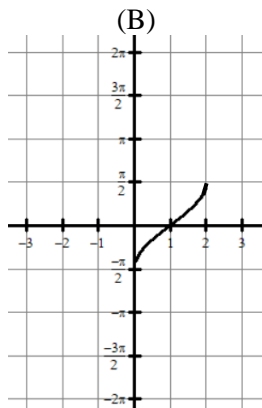
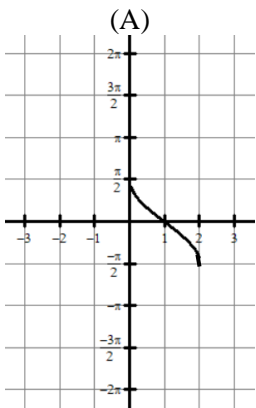
3.9 Inverse Trigonometric Functions

3.9 Test Prep

26. Which of the following is the graph of $f(x) = 2 \cos^{-1}(x)$?



27. Given $f(x) = 1 - \sin(x)$, which of the following is the graph of $f^{-1}(x)$?



28. Given $f(x) = 2 \sin\left(\frac{1}{3}x\right) + 1$ for $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$, what is the domain of $f^{-1}(x)$?

- (A) $\left[-\frac{3\pi}{2}, \frac{3\pi}{2}\right]$
- (B) $[0, 2]$
- (C) $[-1, 3]$
- (D) $[-\pi, \pi]$