4-6 Inverse Trigonometric Functions

Find the exact value of each expression, if it exists.

1. $\sin^{-1} 0$

ANSWER:
0

2. $\arcsin \frac{\sqrt{3}}{2}$

ANSWER:
$\frac{\pi}{3}$

3. $\arcsin \frac{\sqrt{2}}{2}$

ANSWER:
$\frac{\pi}{4}$

4. $\sin^{-1} \frac{1}{2}$

ANSWER:
$\frac{\pi}{6}$

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

ANSWER:
$-\frac{\pi}{4}$

6. arccos 0

ANSWER:
$\frac{\pi}{2}$

7. $\cos^{-1} \frac{\sqrt{2}}{2}$

ANSWER:
$\frac{\pi}{4}$

8. arccos (–1)

ANSWER:
π

9. $\arccos \frac{\sqrt{3}}{2}$

ANSWER:
$\frac{\pi}{6}$

10. $\cos^{-1} \frac{1}{2}$

ANSWER:
$\frac{\pi}{3}$

11. arctan 1

ANSWER:
$\frac{\pi}{4}$

12. arctan $(-\sqrt{3})$

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

13. $\tan^{-1} \frac{\sqrt{3}}{3}$

ANSWER:
$\frac{\pi}{6}$

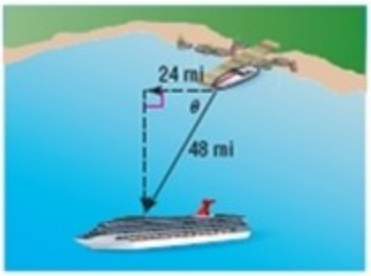
14. $\tan^{-1} 0$

ANSWER:
0

15. **ARCHITECTURE** The support for a roof is shaped like two right triangles, as shown below. Find θ.

ANSWER:
$\frac{\pi}{6}$

16. **RESCUE** A cruise ship sailed due west 24 miles before turning south. When the cruise ship became disabled and the crew radioed for help, the rescue boat found that the fastest route covered a distance of 48 miles. Find the angle θ at which the rescue boat should travel to aid the cruise ship.



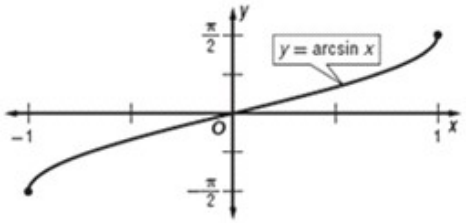
ANSWER:

$\frac{\pi}{3}$ or 60° south of west

Sketch the graph of each function.

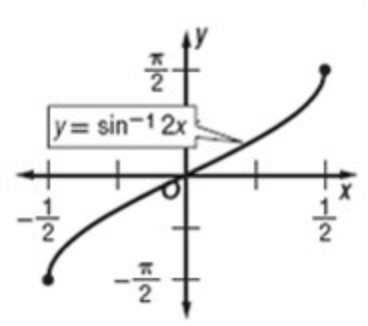
17. $y = \arcsin x$

ANSWER:



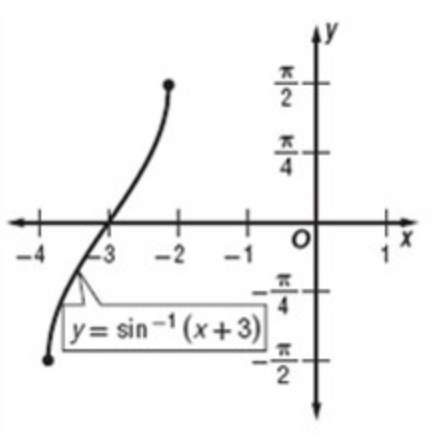
18. $y = \sin^{-1} 2x$

ANSWER:



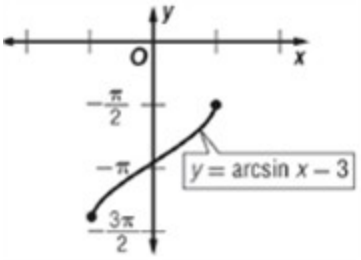
19. $y = \sin^{-1}(x + 3)$

ANSWER:



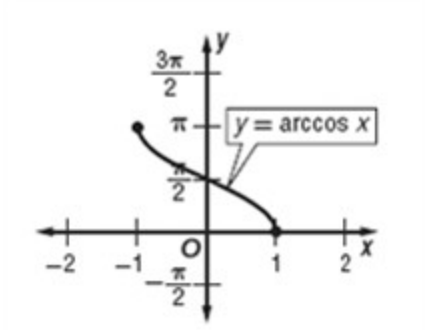
20. $y = \arcsin x - 3$

ANSWER:



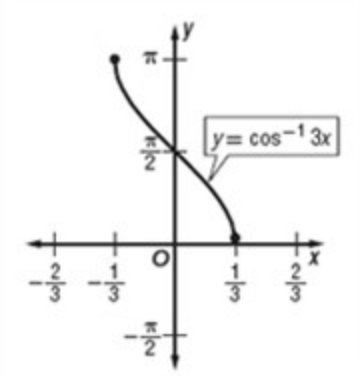
21. $y = \arccos x$

ANSWER:



22. $y = \cos^{-1} 3x$

ANSWER:



Find the exact value of each expression, if it exists.

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

ANSWER:

$\frac{\pi}{2}$

32. $\cos^{-1}(\cos \pi)$

ANSWER:

π

34. $\tan^{-1}\left(\tan \frac{\pi}{3}\right)$

ANSWER:

$\frac{\pi}{3}$

36. $\sin^{-1}\left(\cos \frac{\pi}{2}\right)$

ANSWER:

0