

NO CALCULATORS**Find answers in both radians and degrees for # 1 – 18**

1. $\cos^{-1}(-\frac{1}{2})$ radians $\frac{2\pi}{3}$ Degrees 120°

2. $\sin^{-1}(-\frac{1}{2})$ radians $-\frac{\pi}{6}$ Degrees -30°

3. $\cos^{-1}(\frac{\sqrt{3}}{2})$ radians $\frac{\pi}{6}$ Degrees 30°

4. $\sin^{-1}(\frac{\sqrt{2}}{2})$ radians $\frac{\pi}{4}$ Degrees 45°

5. $\cos^{-1}(-1)$ radians π Degrees 180°
-110

6. $\sin^{-1}(-\frac{\sqrt{3}}{2})$ radians $-\frac{\pi}{3}$ Degrees -60°

7. $\cos^{-1}(-\frac{\sqrt{2}}{2})$ radians $\frac{3\pi}{4}$ Degrees 135°

8. $\cos^{-1}(\frac{1}{2})$ radians $\frac{\pi}{3}$ Degrees 60°

9. $\sin^{-1}(\frac{\sqrt{3}}{2})$ radians $\frac{\pi}{3}$ Degrees 60°

10. $\sin^{-1}(-\frac{\sqrt{2}}{2})$ radians $-\frac{\pi}{4}$ Degrees 45°

11. $\sin^{-1}(-1)$ radians $-\frac{\pi}{2}$ Degrees -90°
(0, -1) +

12. $\cos^{-1}(-\frac{\sqrt{3}}{2})$ radians $\frac{5\pi}{6}$ Degrees 150°

13. $\cos^{-1}(\sin \frac{2\pi}{3})$ radians $\frac{\pi}{6}$ Degrees 30°
 $\cos^{-1}(\frac{\sqrt{3}}{2})$

14. $\sin^{-1}(\cos \frac{5\pi}{6})$ radians $-\frac{\pi}{3}$ Degrees -60°
 $\sin^{-1}(-\frac{\sqrt{3}}{2})$

15. $\sin^{-1}(\sin \frac{\pi}{6})$ radians $\frac{\pi}{6}$ Degrees 30°
 $\sin^{-1}(\frac{1}{2})$

16. $\sin^{-1}(\sin \frac{5\pi}{4})$ radians $-\frac{\pi}{4}$ Degrees -45°
 $\sin^{-1}(-\frac{\sqrt{2}}{2})$

17. $\cos^{-1}(\cos \frac{4\pi}{3})$ radians $\frac{2\pi}{3}$ Degrees 120°
 $\cos^{-1}(-\frac{1}{2})$

18. $\cos^{-1}(\cos \frac{\pi}{4})$ radians $\frac{\pi}{4}$ Degrees 45°
 $\cos^{-1}(\frac{\sqrt{2}}{2})$

19. $\cos(\sin^{-1} \frac{1}{2})$ $\frac{\sqrt{3}}{2}$
 $(\frac{\pi}{6})$

20. $\sin(\cos^{-1}(-\frac{\sqrt{2}}{2}))$ $\frac{\sqrt{2}}{2}$
 $\sin(-\frac{3\pi}{4})$

21. $\tan(\sin^{-1}(-\frac{\sqrt{3}}{2}))$ $-\sqrt{3}$
 $(-\frac{\pi}{3})$

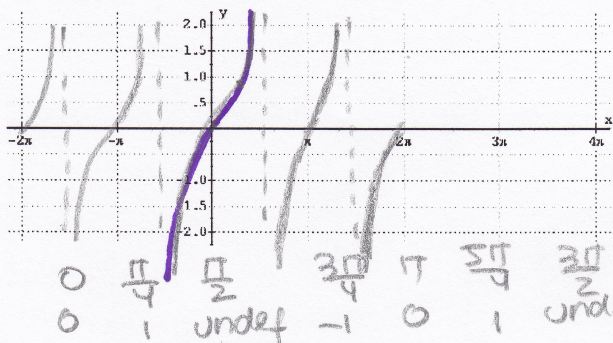
22. $\tan(\cos^{-1}(-\frac{4}{5}))$ $-\frac{3}{4}$
 $\frac{3}{4}$

23. $\cot(\sin^{-1} \frac{5}{7})$ $\frac{2\sqrt{6}}{5}$
 $\frac{2\sqrt{6}}{5}$

24. $\tan(\sin^{-1}(-\frac{12}{13}))$ $-\frac{12}{5}$
 $-\frac{12}{5}$

25. Graph over $-2\pi < x < 2\pi$.

a) $y = \tan x$



Domain: $x \neq \frac{\pi}{2} + n\pi$ Range: all real #s
no not $1-1$

Does this graph have an inverse? Why or why not?

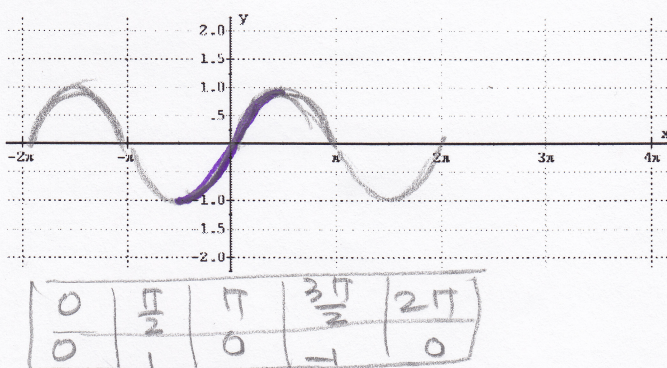
Darken a portion of the graph that is $y = \tan x$:

Domain of $y = \tan x$:

$$-\frac{\pi}{2} < x < \frac{\pi}{2}$$

Graph over $-2\pi < x < 2\pi$ and then darken the portion that has an inverse.

26. $y = \sin x$



Domain:

all real #s

Range: $-1 \leq y \leq 1$

no; not $1-1$

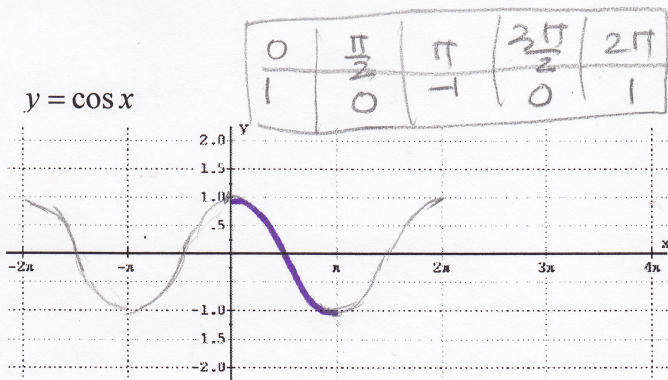
Does this graph have an inverse? Why or why not?

Darken a portion of the graph that is $y = \sin x$

Domain of $y = \sin x$:

$$-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$$

27. $y = \cos x$



Domain: all real

Range: $-1 \leq y \leq 1$

no; not $1-1$

Does this graph have an inverse? Why or why not?

Darken a portion of the graph that is $y = \cos x$

Domain of $y = \cos x$:

$$0 \leq x \leq \pi$$

28. Find one positive and one negative angles that are coterminal with 627°

$$627^\circ - 360^\circ = 267^\circ$$

$$267^\circ - 360^\circ = -93^\circ$$

29. Find one positive and one negative angles that are coterminal with $-\frac{9\pi}{5}$

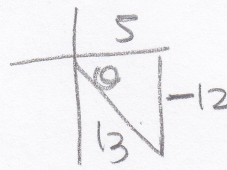
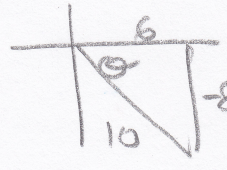
coterminal with $-\frac{9\pi}{5}$

$$-\frac{9\pi}{5} + \frac{2\pi}{1} \cdot \frac{5}{5} = \frac{\pi}{5}$$

$$-\frac{9\pi}{5} - \frac{2\pi}{1} \cdot \frac{5}{5} = -\frac{19\pi}{5}$$

30. Convert to degrees: $\frac{-7\pi}{9}$, $\frac{180^\circ}{\pi} = -140^\circ$

31. Convert to radians: -254° , $\frac{\pi}{180^\circ} = -\frac{127\pi}{90}$

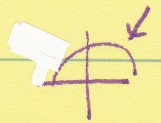
<p>32. A sector of a circle has arc length 15 cm and central angle of 2.5 radians. Find the radius and area.</p> $s = r\theta \rightarrow 15 = r(2.5) \rightarrow r = 6 \text{ cm}$ $A = \frac{1}{2} r^2 \theta = \frac{1}{2} (6)^2 (2.5)$ 45 cm^2	<p>33. A sector of a circle has radius 18 cm and central angle of 34°. Find the arc length and area in terms of π</p> $\frac{34^\circ}{360^\circ} \cdot 2\pi \cdot 18 = 3.4\pi \text{ cm}$ $\frac{34^\circ}{360^\circ} \cdot \pi \cdot 18^2 = \frac{153\pi}{5} \text{ cm}^2$		
<p>34. $\sin \theta = \frac{-12}{13}$; $\frac{3\pi}{2} < x < 2\pi$. Find $\sec \theta$</p>  $\cos \theta = \frac{5}{13}$ $\sec \theta = \frac{13}{5}$	<p>35. The point (6, -8) is on the terminal side of an angle. Find $\csc \theta$</p>  $\sin \theta = \frac{-8}{10} = -\frac{4}{5}$ $\csc \theta = -\frac{5}{4}$		
Express in terms of a reference angle:			
<p>36. $\cos 300^\circ$</p> <p>Q IV: $\cos \oplus$</p> <p>Ref L: $360^\circ - 300^\circ = 60^\circ$</p> <p>$\rightarrow \oplus \cos 60^\circ$</p>	<p>37. $\cot 280^\circ$ Q IV</p> <p>Q IV $\cot \oplus$</p> <p>Ref L: $360^\circ - 280^\circ = 80^\circ$</p> <p>$\rightarrow \oplus \cot 80^\circ$</p>	<p>38. $\sec(-30^\circ) + 360^\circ$</p> <p>$\sec 330^\circ$ Q IV</p> <p>$\sec 15^\circ \oplus$</p> <p>Ref L: 30°</p> <p>$+ \sec 30^\circ$</p>	<p>39. $\csc 170^\circ$ Q II \oplus</p> <p>Ref L: $180^\circ - 170^\circ = 10^\circ$</p> <p>$\rightarrow \csc 10^\circ$</p>
<p>40. $\cos \theta$ and $\sin \theta$ are both negative in what quadrant?</p> <p>\cos is neg in Q II & Q III</p> <p>\sin is neg in Q III & Q IV</p> <p>\rightarrow both neg in Q III</p>	<p>41. $\tan \theta$ and $\cos \theta$ are both negative in what quadrant?</p> <p>\tan is - in Q II & Q IV</p> <p>\cos is - in Q II & Q III</p> <p>\rightarrow both neg in Q II</p>		

13.

$$\cos^{-1} \left(\sin \frac{2\pi}{3} \right)$$

$$\sin \frac{2\pi}{3} = + \frac{\sqrt{3}}{2} \quad (\text{Unit } \odot)$$

$$\cos^{-1} \left(\frac{\sqrt{3}}{2} \right) : \frac{\pi}{6} \text{ or } 30^\circ \quad (\text{Unit } \odot)$$

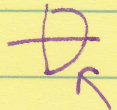


14.

$$\sin^{-1} \left(\cos \frac{5\pi}{6} \right)$$

$$\cos \frac{5\pi}{6} = - \frac{\sqrt{3}}{2} \quad (\text{Unit } \odot)$$

$$\sin^{-1} \left(- \frac{\sqrt{3}}{2} \right) = \ominus \frac{\pi}{3} \text{ or } -60^\circ \quad (\text{Unit } \odot)$$

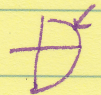


15.

$$\sin^{-1} \left(\sin \frac{\pi}{6} \right)$$

$$\sin \frac{\pi}{6} = \frac{1}{2} \quad (\text{Unit } \odot)$$

$$\sin^{-1} \left(\frac{1}{2} \right) = \frac{\pi}{6} \text{ or } 30^\circ \quad (\text{Unit } \odot)$$

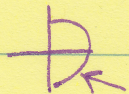


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$$\sin^{-1} \left(\sin \frac{5\pi}{4} \right)$$

$$\sin \frac{5\pi}{4} = - \frac{\sqrt{2}}{2} \quad (\text{Unit } \odot; \text{Q III})$$

$$\sin^{-1} \left(- \frac{\sqrt{2}}{2} \right) = \ominus \frac{\pi}{4} \text{ or } -45^\circ$$



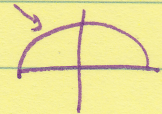
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$$\cos^{-1} \left(\cos \frac{4\pi}{3} \right)$$

$$\cos \frac{4\pi}{3} = - \frac{1}{2} \quad (\text{Unit } \odot \text{ Q III})$$

$$\cos^{-1} \left(- \frac{1}{2} \right) \rightarrow \text{answer is in Q II}$$

$$\frac{2\pi}{3} \text{ or } 120^\circ$$

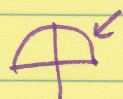


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$$\cos^{-1} \left(\cos \frac{\pi}{4} \right)$$

$$\cos \frac{\pi}{4} = \frac{\sqrt{2}}{2} \quad (\text{Unit } \odot)$$

$$\cos^{-1} \left(\frac{\sqrt{2}}{2} \right) = \frac{\pi}{4} \text{ or } 45^\circ$$



19.

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


$$\sin^{-1} \left(\frac{1}{2} \right) \rightarrow \frac{\pi}{6} \text{ or } 30^\circ \quad (\text{Unit } \odot)$$

$$\cos \frac{\pi}{6} = \frac{\sqrt{3}}{2}$$

20. $\sin(\cos^{-1}(-\frac{\sqrt{2}}{2}))$

$\cos^{-1}(-\frac{\sqrt{2}}{2}) = \frac{3\pi}{4}$

$\sin \frac{3\pi}{4} = \frac{\sqrt{2}}{2}$ (Q II unit \ominus)



21. $\tan(\sin^{-1}(-\frac{\sqrt{3}}{2}))$

$\sin^{-1}(-\frac{\sqrt{3}}{2}) = \theta$

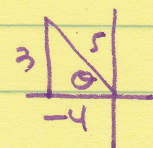
$\theta = -60^\circ$

$\tan(-60^\circ) = -\sqrt{3}$ unit \ominus

22. $\tan(\cos^{-1}(-\frac{4}{5}))$

$\cos^{-1}(-\frac{4}{5}) = \theta$

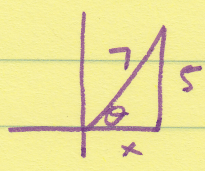
$\tan \theta = \frac{3}{-4} = -\frac{3}{4}$



23. $\cot(\sin^{-1}(\frac{7}{5}))$

$\cot \theta = \frac{x}{5}$

$= \frac{2\sqrt{6}}{5}$



$x^2 + 5^2 = 7^2$

$x^2 = 49 - 25 = 24$

$x = 2\sqrt{6}$

24. $\tan(\sin^{-1}(-\frac{12}{13}))$

$\tan \theta = -\frac{12}{5}$

