PRE-CALCULUS PREAP ASSIGNMENT SHEET

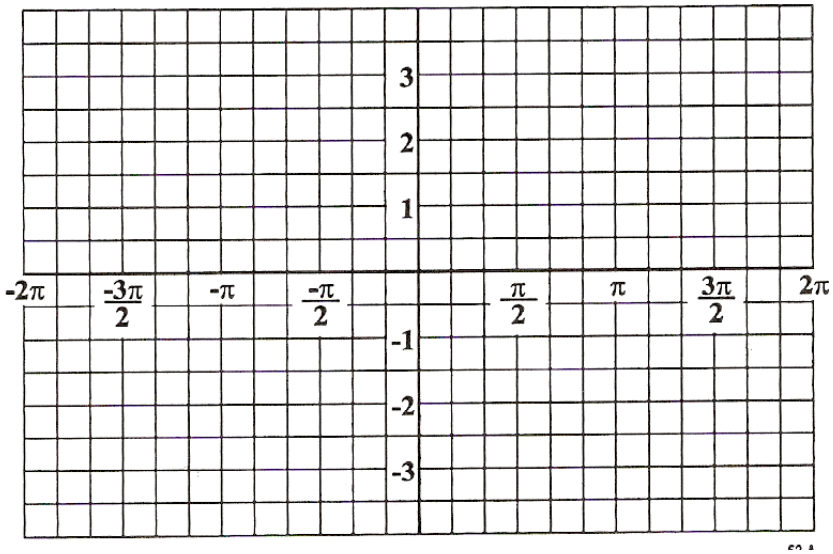
UNIT #6 GRAPHING OTHER TRIG FUNCTIONS AND INVERSE TRIG FUNCTIONS

Mon., Nov. 5th	Test over Sine and Cosine and Applications	
Tue., Nov 6th	Graphing Secant, Cosecant, Tangent and Cotangent Functions	Book reference Sec 4.6 p. 332 Assignment Day 1 Graphing
Wed., Nov 7th	Graphing Others	Day 2 Graphing plus Asymptote worksheet
Thurs., Nov 8th	Writing Equations and Graphing	Writing Worksheet # 1 & 2
Fri., Nov 9th	QUIZ over Other Graphing Begin Graphing Inverse Trig Functions	Assignment Graphing Inverse
Mon., Nov 12th	Inverse Angles and Values Day 1	Packet plus text p. 350 # 59-64
Tue., Nov 13th	Inverse Values and Angles Day 2	Worksheet
Wed., Nov 14th	QUIZ	Sec 4.3 in text Assignment Packet p. 17 plus review
Thurs., Nov 15th	Review Game	Study for Test
Fri., Nov 16th	Test over 4.3,4.6,4.7	No Homework

GRAPHING ALL SIX TRIG FUNCTIONS

y = cos θ Basic shape_____

Domain_____Range_____



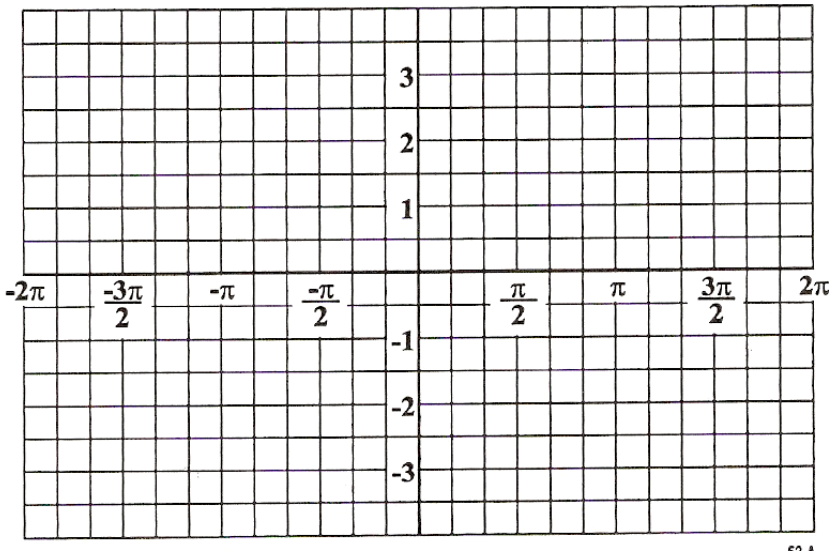
y = sec θ Basic shape_____

Domain_____

Range_____

Equation of asymptotes_____

Two specific asymptotes_____



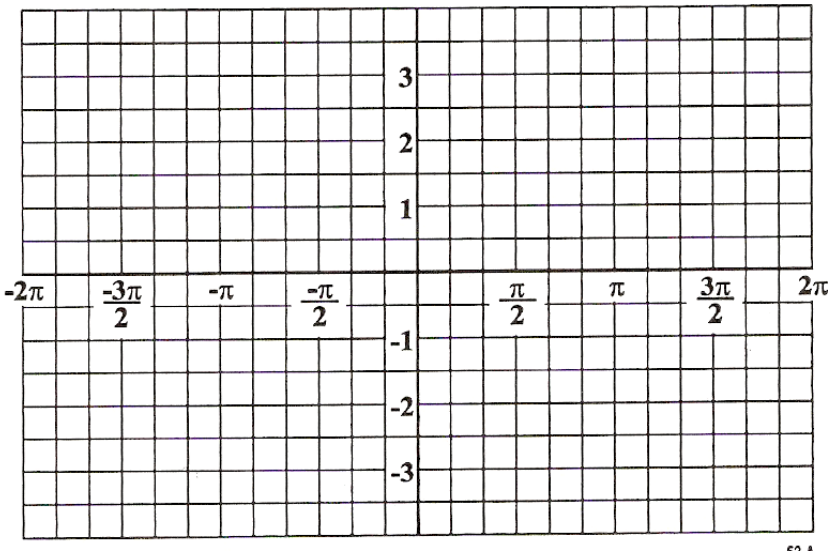
y = tan θ Basic shape_____

Domain_____

Range_____

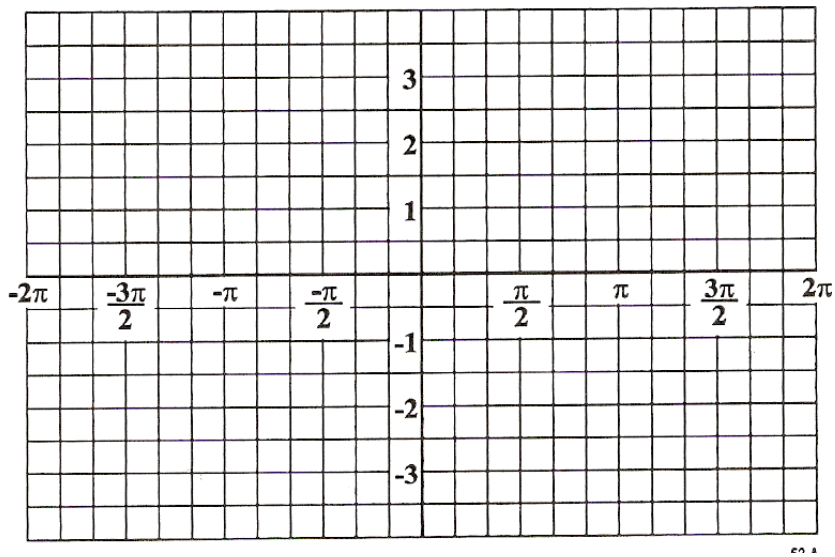
Equation of asymptotes_____

Two specific asymptotes_____



y = sin θ Basic shape_____

Domain_____Range_____



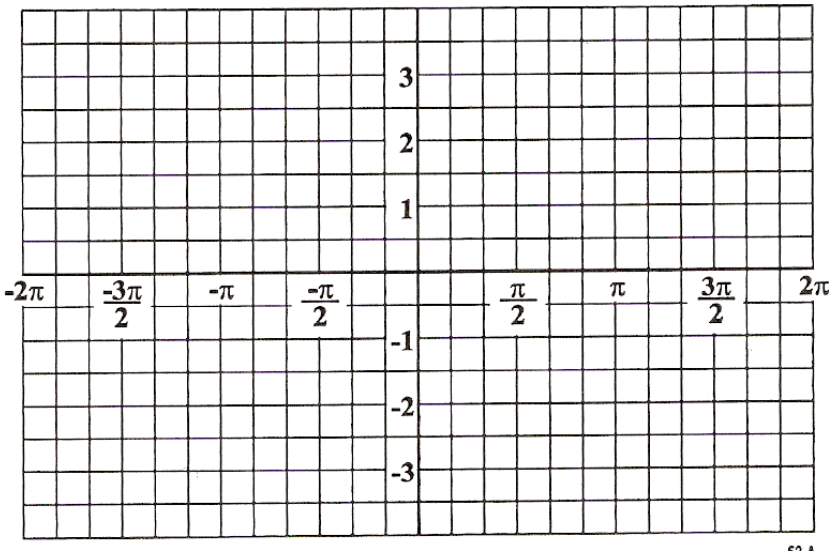
y = csc θ Basic shape_____

Domain_____

Range_____

Equation of asymptotes_____

Two specific asymptotes_____



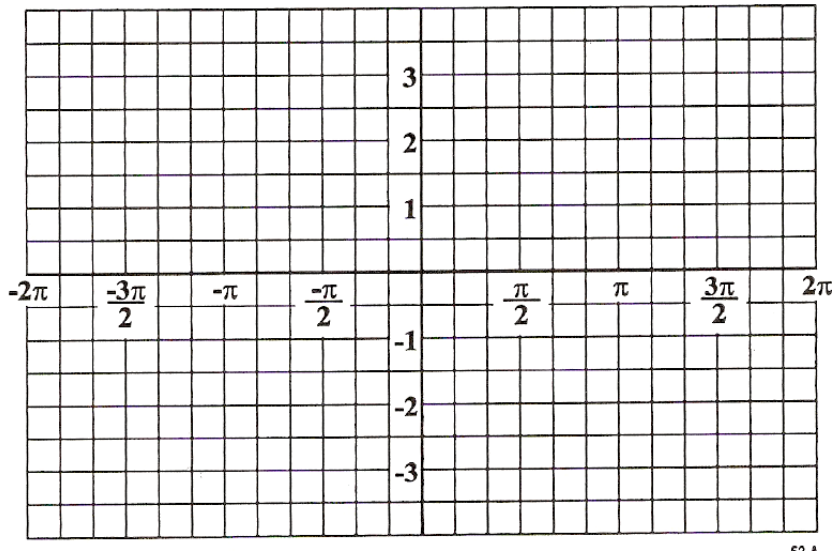
y = cot θ Basic shape_____

Domain_____

Range_____

Equation of asymptotes_____

Two specific asymptotes_____



Day 1 GRAPHING

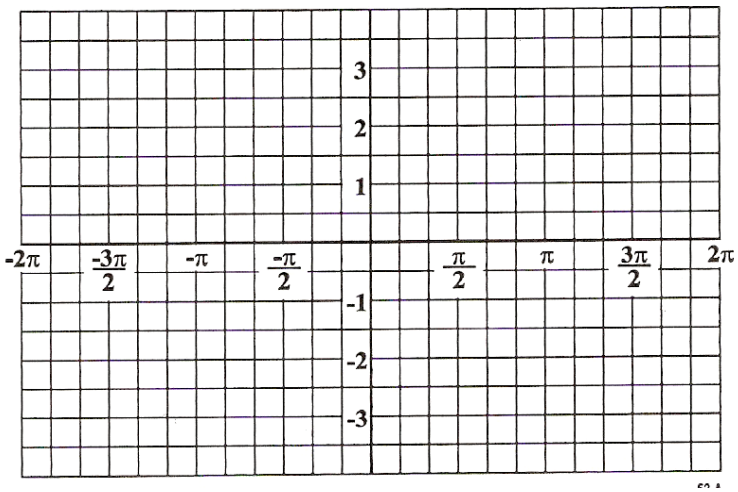
1) $y = \tan\left(x + \frac{\pi}{2}\right)$

Domain_____

Range_____

Equation of asymptotes_____

Two specific asymptotes_____



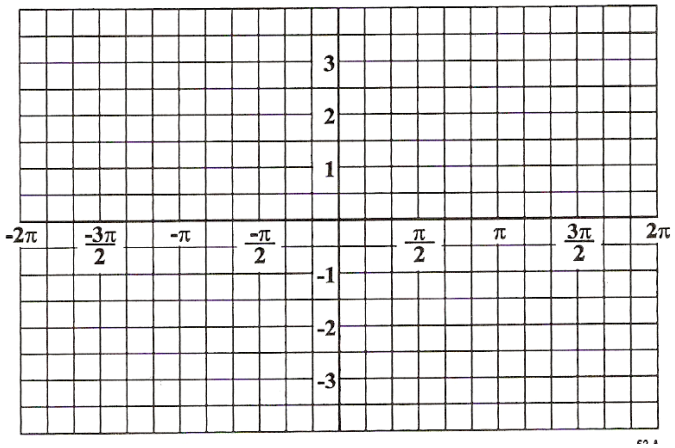
2) $y = \cot\left(\theta - \frac{\pi}{4}\right)$

Domain_____

Range_____

Equation of asymptotes_____

Two specific asymptotes_____



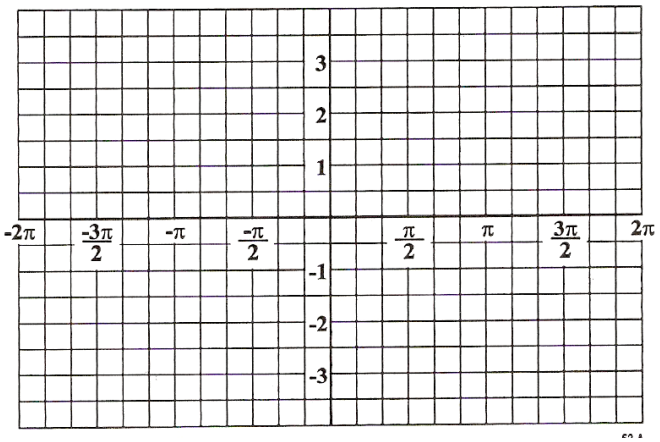
3) $y = 2\sec\ \theta + \pi$

Domain_____

Range_____

Equation of asymptotes_____

Two specific asymptotes_____



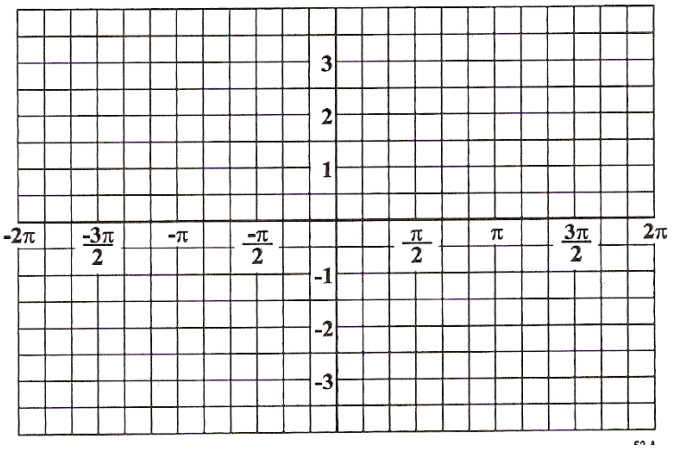
4) $y = \frac{1}{2}\csc\ x - \pi\ - 1$

Domain_____

Range_____

Equation of asymptotes_____

Two specific asymptotes_____



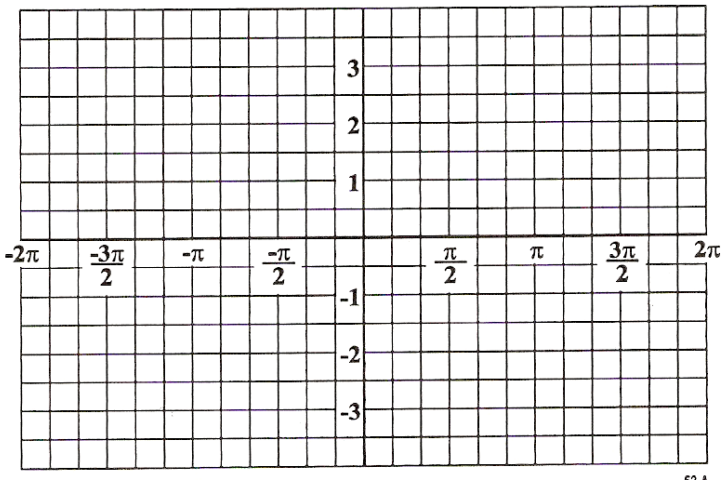
5) $y = -3\sec\left(x + \frac{\pi}{6}\right) + 1$

Domain_____

Range_____

Equation of asymptotes_____

Two specific asymptotes_____



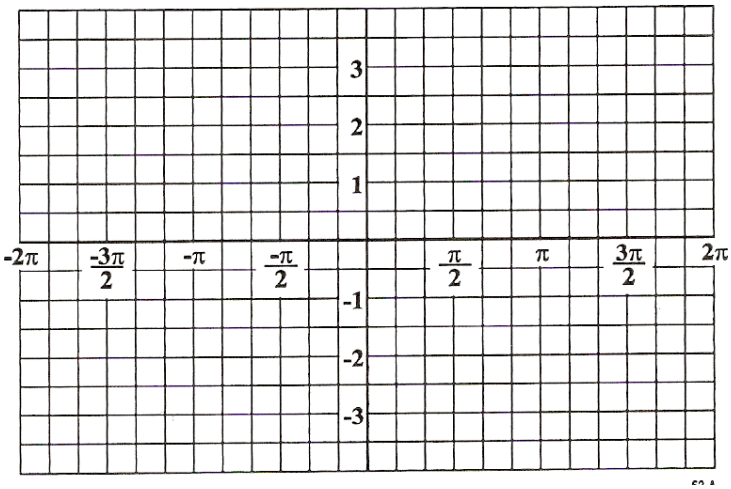
6) $y = \csc\left(3\theta + \frac{\pi}{2}\right) + 3$

Domain_____

Range_____

Equation of asymptotes_____

Two specific asymptotes_____



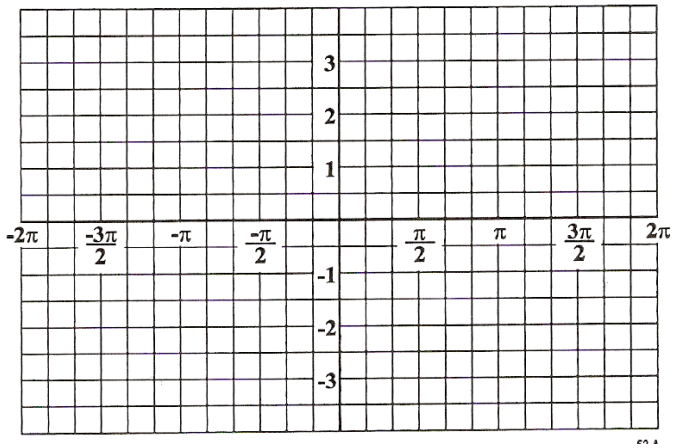
7) $y = -2\tan 2x + 3$

Domain_____

Range_____

Equation of asymptotes_____

Two specific asymptotes_____



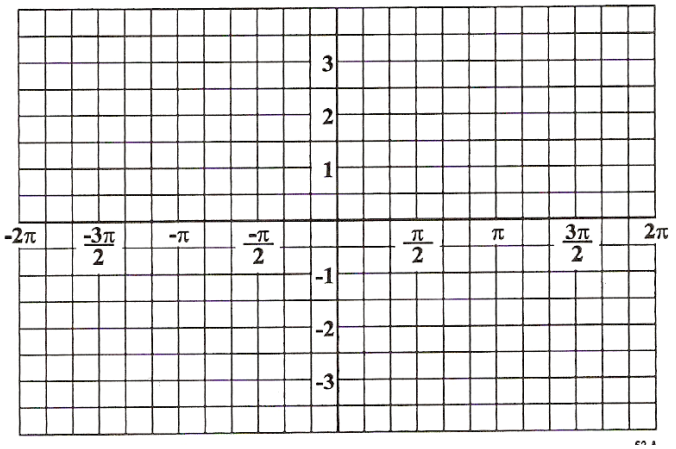
8) $y = -\cot\left(\frac{1}{2}\theta + \pi\right) - 2$

Domain_____

Range_____

Equation of asymptotes_____

Two specific asymptotes_____



PRECALCULUS TRIG EQUATIONS AND THEIR ASYMPTOTES

Match the equation with its asymptotes.

Equation		Asymptotes	
___1.	$y = \frac{1}{2}\tan x + 3$	A.	$k\pi$
___2.	$y = 2\sec x$	B.	$\frac{\pi}{2} + k\pi$
___3.	$y = \csc 2x - 4$	C.	$\frac{\pi}{4} + \frac{k\pi}{2}$
___4.	$y = \tan x + 2$	D.	$\frac{k\pi}{2}$
___5.	$y = \sec \frac{1}{2}x + 4$	E.	$\pi + 2k\pi$
___6.	$y = -3\cot x - 2$	F.	$2k\pi$
___7.	$y = \cot (x - \frac{\pi}{2})$	G.	$\frac{\pi}{4} + k\pi$
___8.	$y = \sec \frac{1}{2} x$		
___9.	$y = \csc (2x - \frac{\pi}{2})$		
___10.	$y = \tan (x + \frac{\pi}{2})$		
___11.	$y = \sec (x - \frac{\pi}{2})$		
___12.	$y = \tan (2x + \frac{\pi}{2})$		
___13.	$y = -4 \tan \frac{1}{2}x + 3$		
___14.	$y = \csc \frac{1}{2}x + 3$		
___15.	$y = \cot(x - \frac{\pi}{4})$		
___16.	$y = 5\sec(2x + \pi) + 1$		

Graphing Trig Functions

Day 1

Find the period, domain and range of each function. Find the general equation of the asymptotes and two specific asymptotes on all $\sec\theta$, $\csc\theta$, $\tan\theta$, and $\cot\theta$ functions.

1) $y = \tan\left(x + \frac{\pi}{2}\right)$ 2) $y = \cot\left(\theta - \frac{\pi}{4}\right)$ 3) $y = \sec\ \theta + \pi$

4) $y = \csc\ x - \pi\ - 1$ 5) $y = -3\sec\left(x + \frac{\pi}{6}\right) + 1$ 6) $y = \csc\left(3\theta + \frac{\pi}{2}\right) + 3$

7) $y = -2\tan 2x + 3$ 8) $y = -\cot\left(\frac{1}{2}\theta + \pi\right) - 2$ 9) $y = \frac{1}{2}\sec 2\left(x - \frac{\pi}{2}\right) + 1$

10) $y = -2\csc 2x - 1$ 11) $y = 3\cot\left(x + \frac{\pi}{6}\right) - 1$ 12) $y = -\frac{3}{2}\tan\left(x - \frac{\pi}{6}\right)$

Day 2

Graphing Others Day 2

Graph one cycle of each function.

1. $y = \tan\frac{1}{4}x$ 2. $y = -3\sec\left(x - \frac{\pi}{2}\right)$ 3. $y = \csc\frac{3}{4}x - 1$

Graph and state whether each function is odd, even or neither.

4. $y = \tan\left(x - \frac{\pi}{2}\right)$ 5. $y = \cot(x) + 2$

If F is any function with period 5, determine the period of each related function. Provide a reason for your answer.

6. $y = F(x + 1)$ 7. $y = F(x) + 5$ 8. $y = F\left(\frac{1}{2}x\right)$ 9. $y = F(3x)$

Graph one cycle of each function.

10. $y = \tan\left(2x - \frac{4\pi}{3}\right) + 1$ 11. $y = 3\csc\left(2x + \frac{4\pi}{3}\right) + 1$

GRAPHING INVERSE TRIG FUNCTIONS

Find the domain, range, and sketch a complete graph of each function. **Inverse functions are denoted by** $y = \sin^{-1} x$ **or by** $y = A\sin x$.

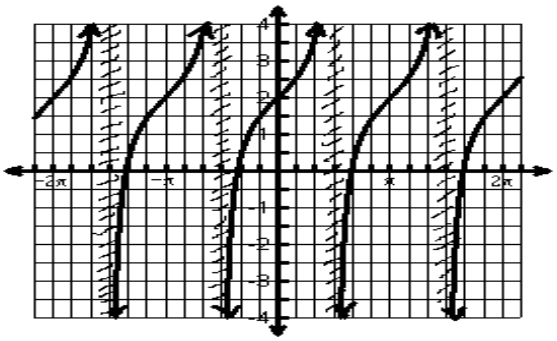
1) $y = \sin^{-1}(3x)$ 2) $y = \cos^{-1}(x) - \frac{\pi}{2}$ 3) $y = \text{arc sin}\,(x+1)$ 4) $y = 2\sin^{-1}\left(\frac{x}{3}\right)$

5) $y = 3\ \arccos(2x-4)$ 6) $y = \tan^{-1}(x-1) + \pi$ 7) $y = -\text{arc sin}\,x + \frac{\pi}{2}$

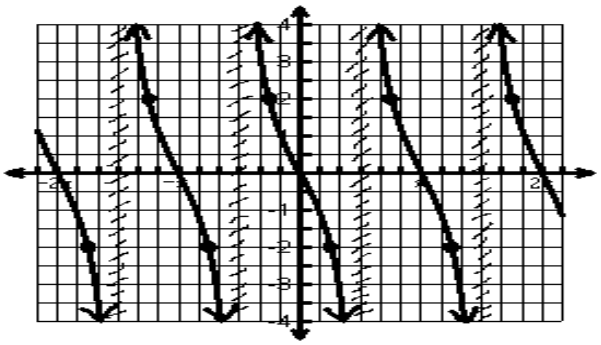
8) $y = 3\cos^{-1}(x-2)$ 9) $y = -\frac{1}{4}\tan^{-1}(x-1)$ 10) $y = \cot^{-1}x + 1$

Writing Trig Equations WS #1

1)



2)



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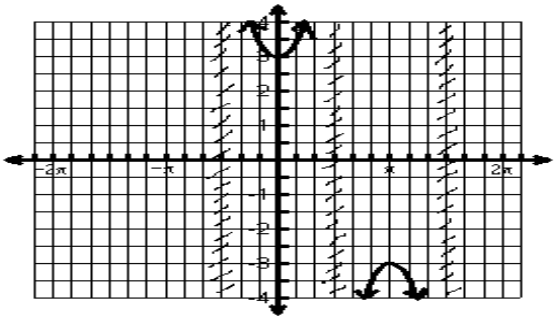

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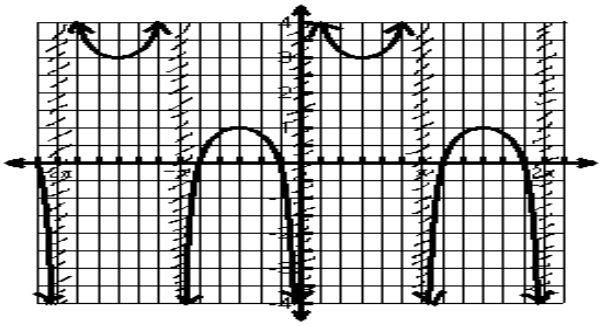

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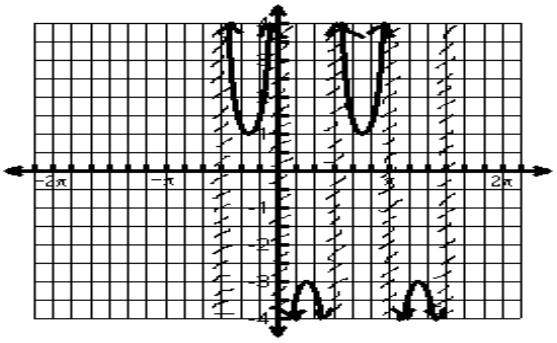
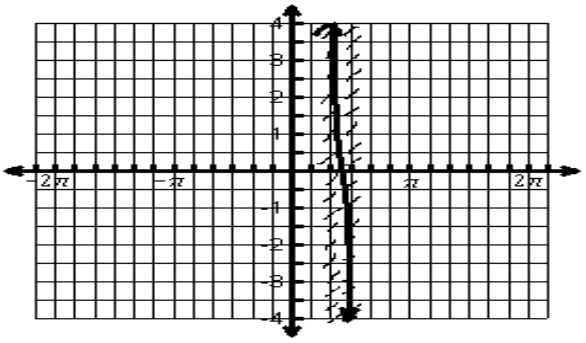


6)



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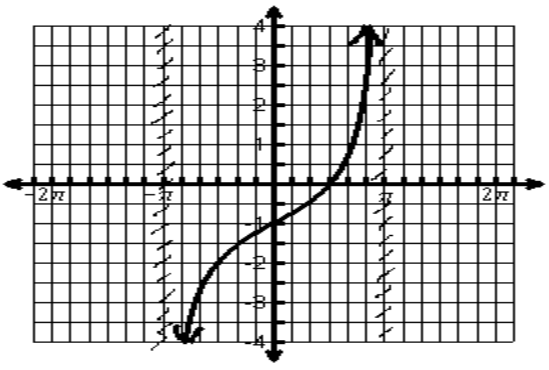

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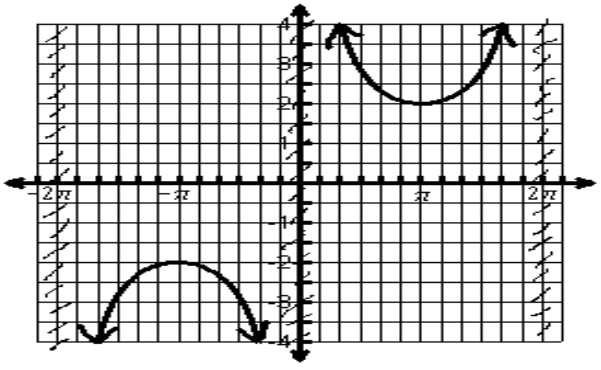
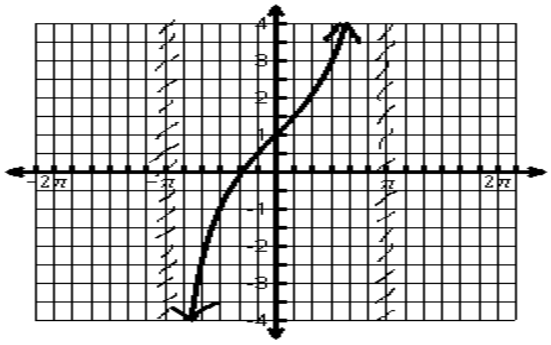
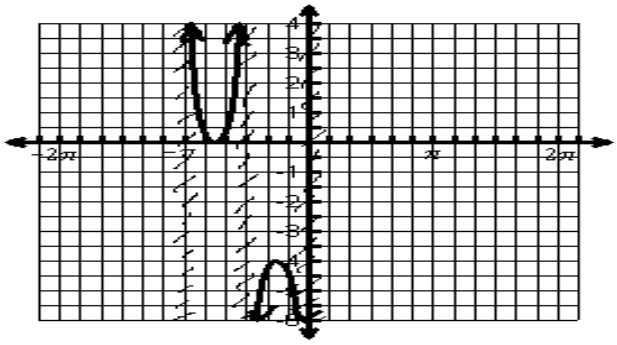


Writing Trig Equations WS #2

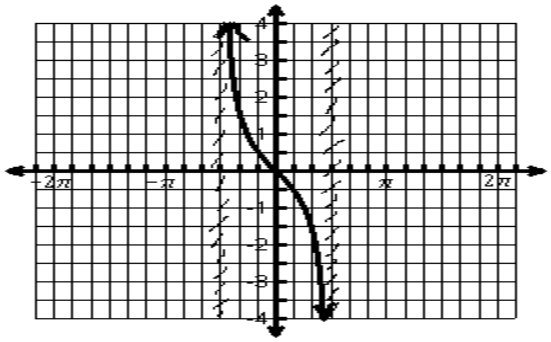
1)



2)



3)



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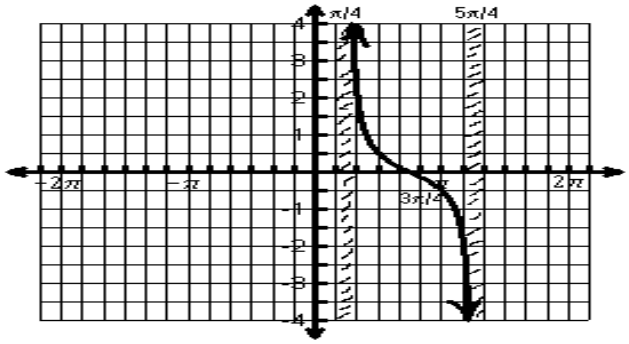

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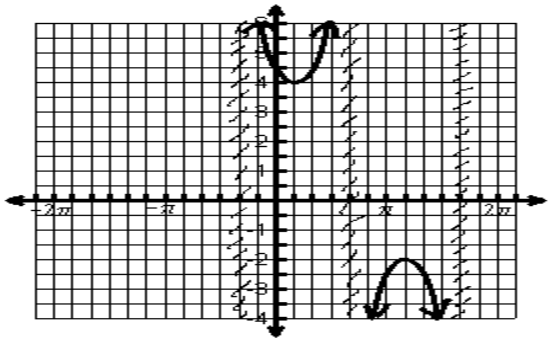

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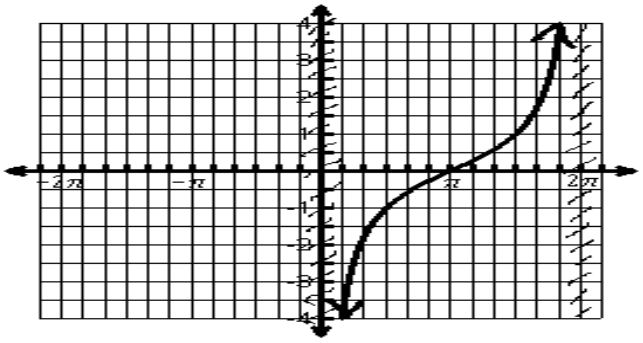

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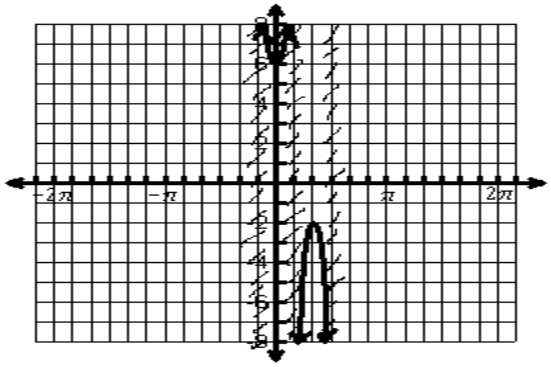

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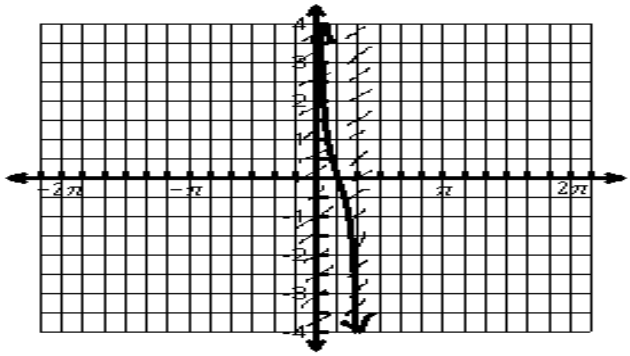
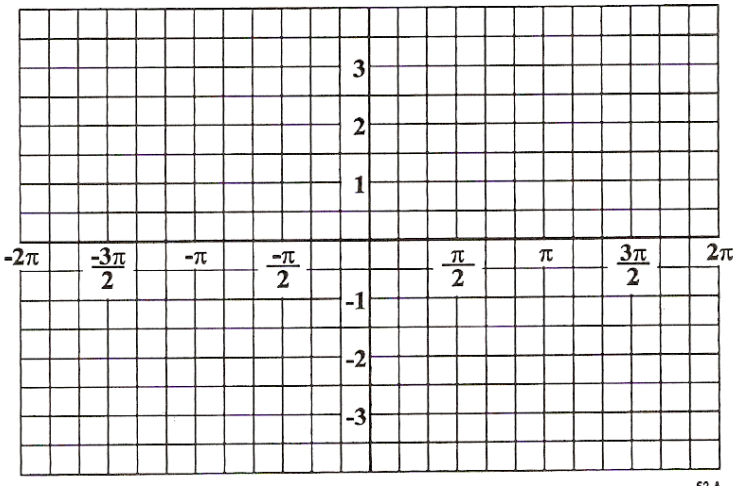


Graph one cycle and fill in the blanks.

1. $y = \frac{1}{2}\sec 2\left(x - \frac{\pi}{2}\right) + 1$ Period = _____ Equation of Asymptotes _____

Three Specific Asymptotes

_____

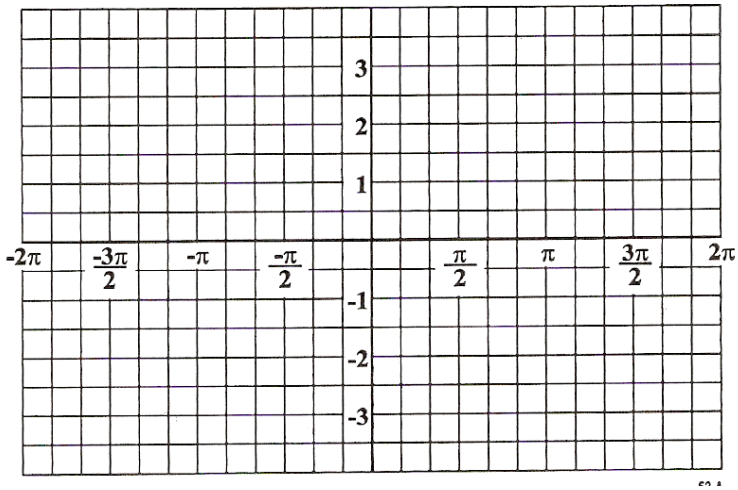


_____

2. $y = 3\cot\left(x + \frac{\pi}{6}\right) - 1$ Period = _____ Equation of Asymptotes _____

Two Specific Asymptotes

_____



_____

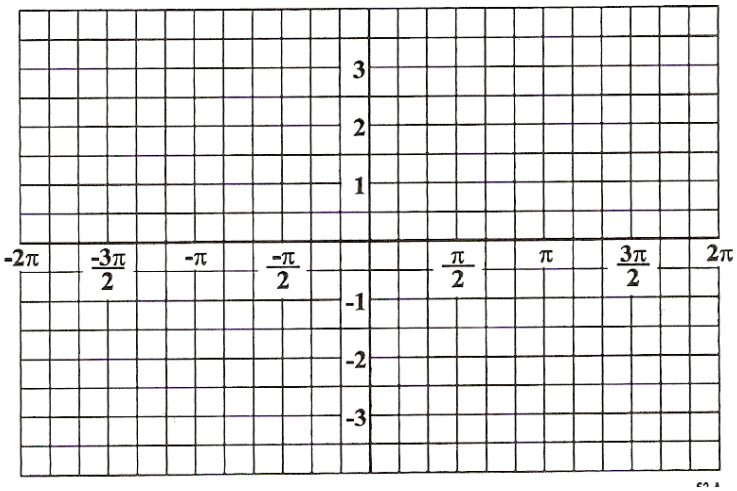
3. $y = -2\csc 2x - 1$ Period = ____

Equation of Asymptotes

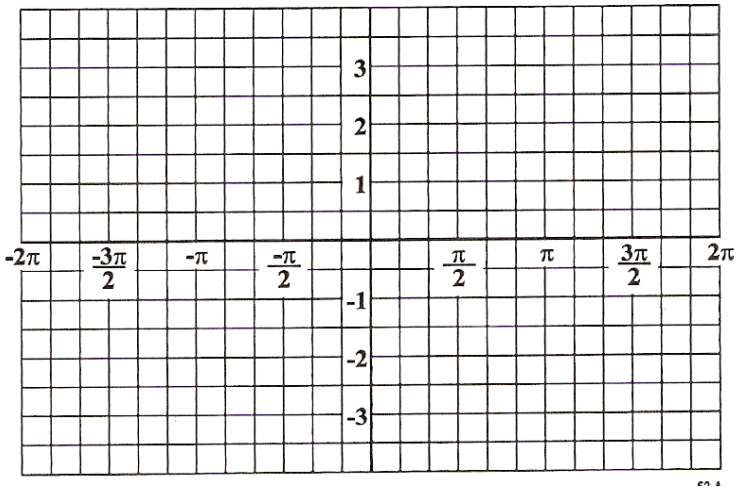
_____

Three Specific Asymptotes

_____



4. $y = -\frac{3}{2}\tan\left(x - \frac{\pi}{6}\right)$



Period = _____

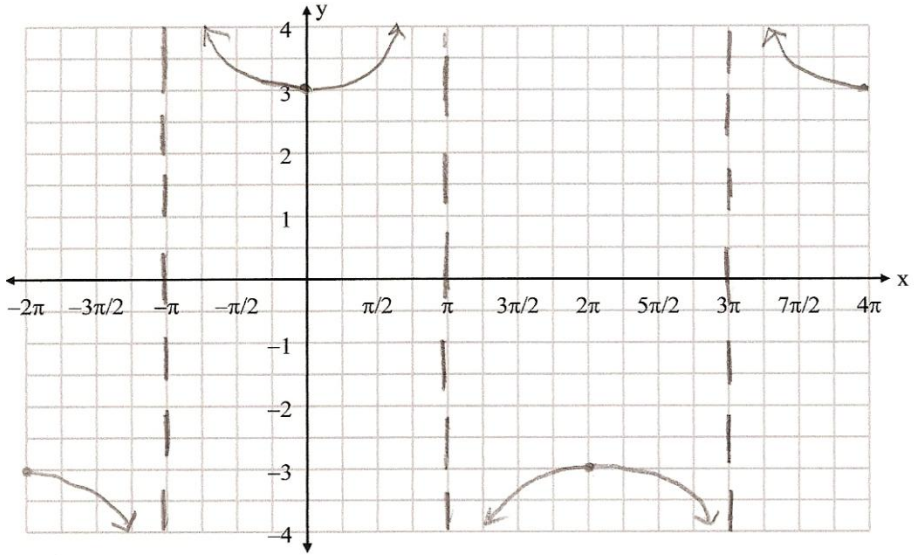
Equation of Asymptotes _____

Two Specific Asymptotes _____

_____

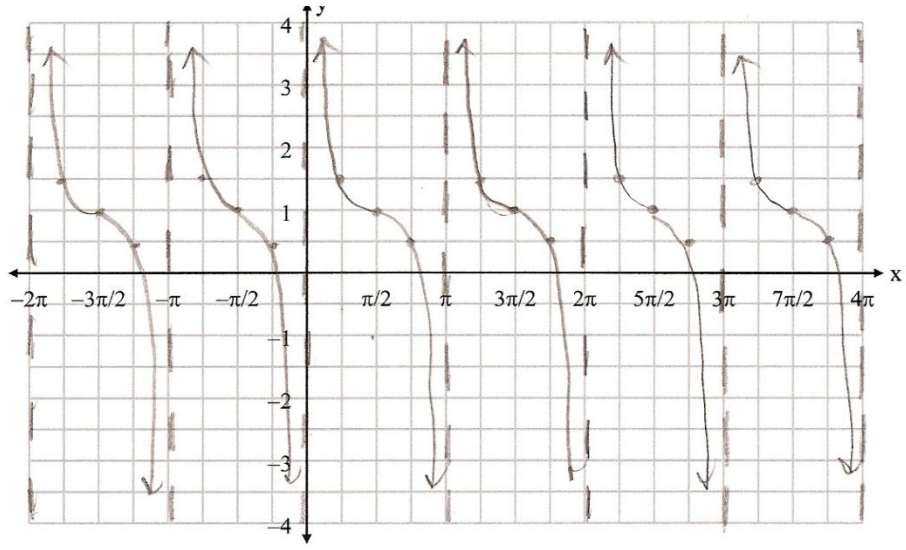
Write the equation for each graph.

5.



Equation: _____

6.



Equation: _____

Evaluate.

7. $\cos\frac{2\pi}{3} =$

8. $\tan\frac{5\pi}{4} =$

9. $\sin\frac{5\pi}{3} =$

10. $\cot\frac{2\pi}{3} =$

11. $\csc\frac{5\pi}{6} =$

12. $\sec 3\pi =$

13. $\cos\frac{5\pi}{6}\sin\frac{\pi}{4} - \sin\frac{5\pi}{6}\cos\frac{\pi}{4} =$

14. $\cos\frac{3\pi}{4}\cos\frac{7\pi}{6} + \sin\frac{3\pi}{4}\sin\frac{7\pi}{6} =$

15. $\dfrac{\tan\frac{\pi}{3} + \tan\frac{7\pi}{4}}{1 - \tan\frac{\pi}{3}\tan\frac{7\pi}{4}} =$

If $0 \le \theta < 2\pi$, determine the values of θ in <u>radians</u> that make each statement true.

16. $\cos\theta = -\frac{\sqrt{3}}{2}$

17. $\tan\theta = -\sqrt{3}$

18. $\csc\theta = -2$

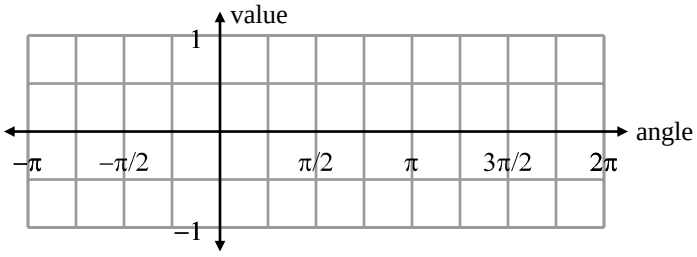
19. $\cot^2\theta = \frac{1}{3}$

20. $\sec^2\theta = \frac{4}{3}$

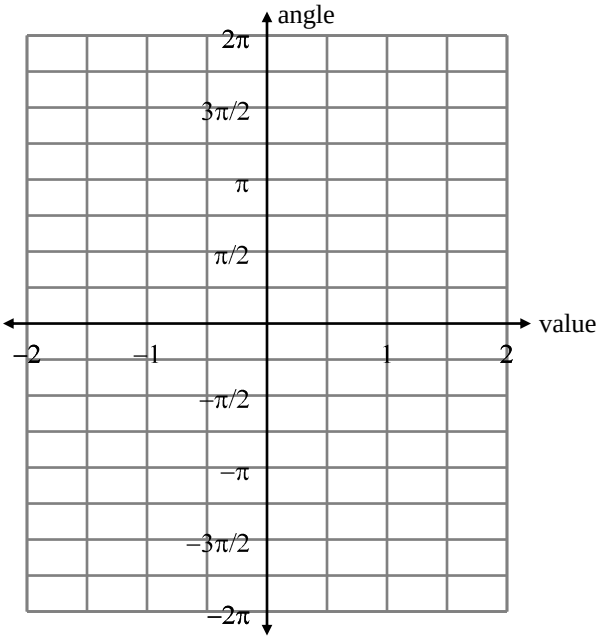
21. $\csc^2\theta = 2$

Notes on graphing inverses of sine and cosine graphs

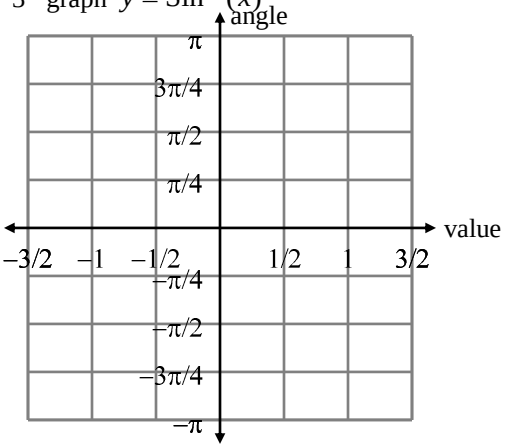
1st Graph y = sin x



2nd Interchange the values in the ordered pair and sketch in the graph below:

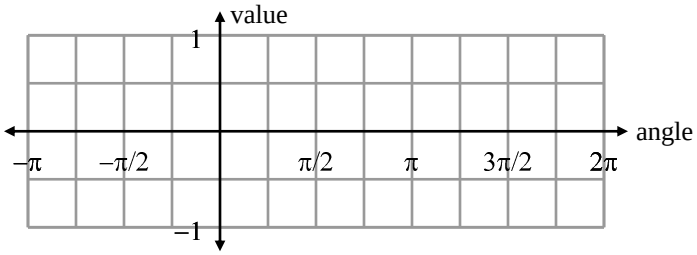


3rd graph $y = \mathrm{Sin}^{-1}(x)$

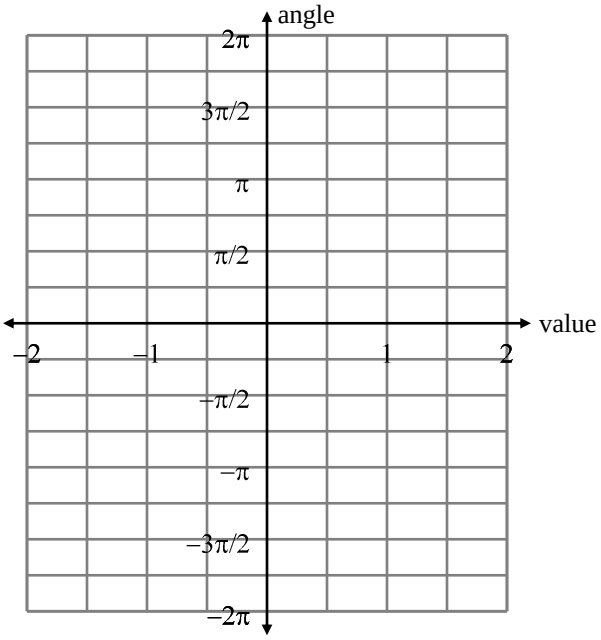


Part 2) Do the same as above but to the graph y = cosine x

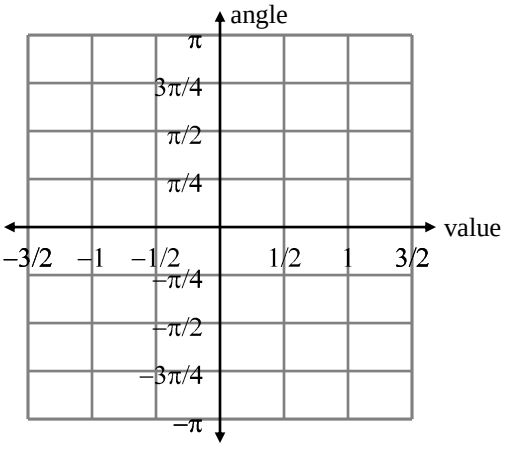
1st Graph y = cos x



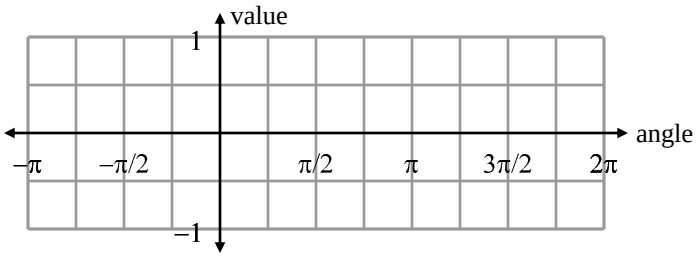
2nd Interchange the values in the ordered pair and sketch in the graph below:



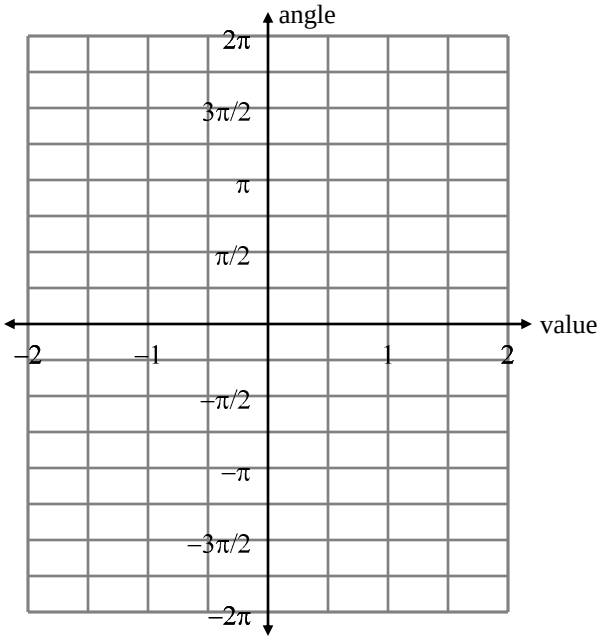
3rd graph $y = \mathrm{Cos}^{-1}(x)$



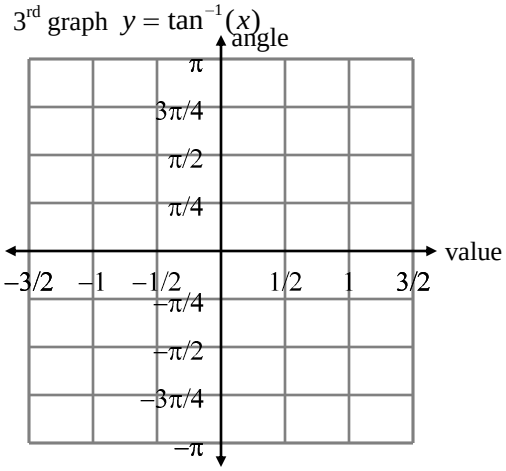
1st Graph y = tan x



2nd Interchange the values in the ordered pair and sketch in the graph below:

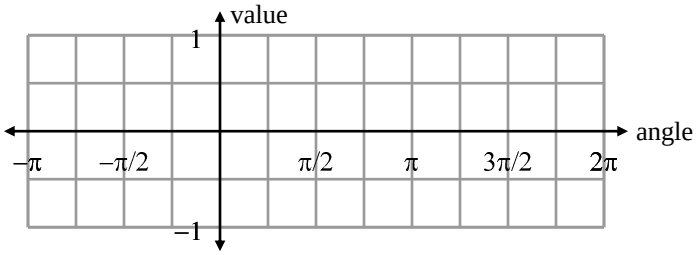


3rd graph $y = \tan^{-1}(x)$

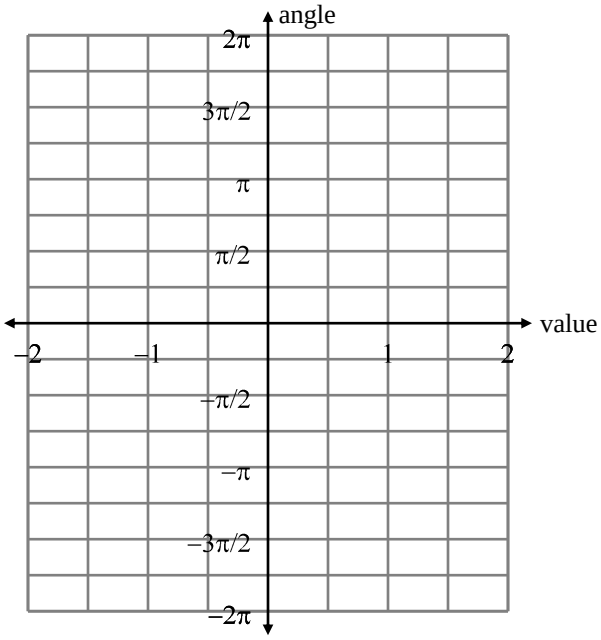


Part 2) Do the same as above but to the graph y = cosine x

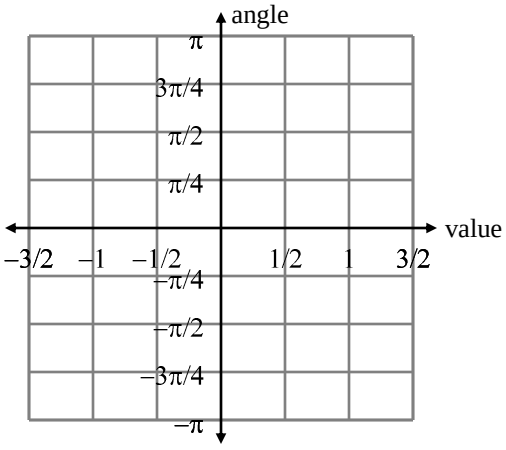
1st Graph y = cot x



2nd Interchange the values in the ordered pair and sketch in the graph below:



3rd graph $y = \mathrm{Cot}^{-1}(x)$



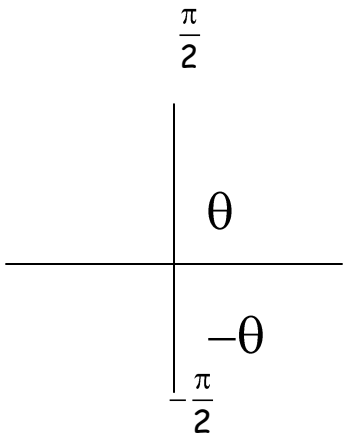
INVERSE TRIG FUNCTIONS PROBLEMS NOTES

TWO GROUPS BASED ON SIMILAR RANGE

$y = \sin^{-1} x \quad [-\frac{\pi}{2}, \frac{\pi}{2}]$

$y = \tan^{-1} x \quad (-\frac{\pi}{2}, \frac{\pi}{2})$

$y = \csc^{-1} x \quad [-\frac{\pi}{2}, \frac{\pi}{2}] \ , \ y \neq 0$



Sample Problems

Reference Triangles ex 1 $\sin(\arctan(\frac{3}{5}))$ 2 $\cot(\sin^{-1}(\frac{-\sqrt{10}}{10}))$

3 sec(arc tan 3x)

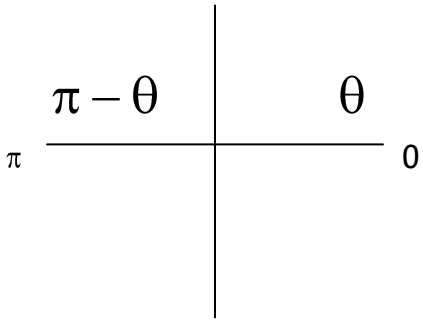
Angle Problems 4 $\sin^{-1}(\frac{\sqrt{3}}{2})$ 5 arc tan(-1) 6 $\arcsin(\tan\frac{3\pi}{4})$

SECOND GROUP

$y = \cos^{-1} x \quad [0, \pi]$

$y = \sec^{-1} x \quad [0, \pi] \quad y \neq \frac{\pi}{2}$

$y = \cot^{-1} x \quad (0, \pi)$



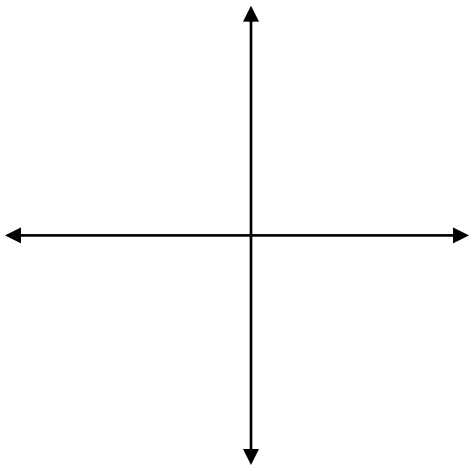
Sample Problems

Reference Triangles ex 1 $\sin(\arccos(\frac{3}{5}))$ 2 $\sin(\cos^{-1}(\frac{-\sqrt{10}}{10}))$

3 sec(arc csc 3x)

Angle Problems 4 $\cos^{-1}(\frac{\sqrt{3}}{2})$ 5 arc cot(-1) 6 $\arcsin(\cos\frac{3\pi}{4})$

Summary of quadrant locations for inverse functions.



Examples: Find the exact values without using a calculator.

1. $\sin^{-1} 1 =$ _____

2. $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right) =$ _____

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

4. $Arccos\left(\frac{1}{2}\right) =$ _____

5. $\tan^{-1} -\sqrt{3} =$ _____

6. $\csc^{-1}\left(\frac{2}{\sqrt{3}}\right) =$ _____

7. $Arc\csc 2 =$ _____

8. $\sec^{-1} \sqrt{2} =$ _____

9. $\sec^{-1} -\sqrt{2} =$ _____

10. $Arc\cot\left(-\frac{1}{\sqrt{3}}\right) =$ _____

Find the exact value:

11. $\sin\left(Arccos\frac{1}{2}\right) =$ _____

12. $Arcsin\left(\sin\frac{7\pi}{6}\right) =$ _____

13. $Arc\sec\left(\sec\left(-\frac{\pi}{4}\right)\right) =$ _____

14. $\sin^{-1}\left(\sin\frac{\pi}{4}\right) =$ _____

15. $\sin\left(\cos^{-1}\left(\frac{\sqrt{3}}{4}\right)\right) =$ _____

16. $\cos\left(Arcsin\left(-\frac{2}{7}\right)\right) =$ _____

17. $\tan\left(\sin^{-1}\left(\frac{1}{\sqrt{2}}\right)\right) =$ _____

18. $\sin\ \tan^{-1}(-1) =$ _____

19. $\cos\left(\cot^{-1}\left(-\frac{12}{5}\right)\right) =$ _____

20. $\cos\left(Arcsin\left(-\frac{5}{13}\right)\right) =$ _____

21. $\sin Arc\cos\left(\frac{3}{4}\right) =$ _____

22. $\csc\left(\cos^{-1}\left(\frac{2}{9}\right)\right) =$ _____

23. Arccot(-1)=_____

24. $\cot^{-1} -\sqrt{3} =$ _____