

Name: _____

Per: _____

Midterm Review!

Look at how much stuff you've learned so far this year! And it's not even Halloween yet. On this review you'll find some examples of the topics we've learned about. You do not need to work out every question on the review!!! Skip around and work the types of questions you've struggled with or don't remember. You also should look at your notes and old quizzes and tests to see what material you don't remember or struggled with. Questions marked with *** are questions you can use a calculator for. The test will be split into a non-calculator portion on Thursday and a calculator portion on Friday. If you are absent, you will need to arrange a time with your partner next week Monday or Tuesday to make up the portion you missed

Unit 1- Right Triangle Trig

Find coterminal angles

Graph angles in radians and degrees

Find radian values on the unit circle

Convert radians to degrees

Find reference angles

Exact values on the unit circle

***Evaluating trig and inverse values

***Trig in the real world

Unit 2- Trig Graphing

Graph sinusoidal functions

Graph tan, cot, sec, csc functions

Write equations of all trig graphs

Unit 3- Inverses

Graph inverse trig parent functions in their restricted range

Evaluate principal inverse values

Find general solutions to trig equations

Evaluate trig composition with exact values and variables

Unit 4- Modeling (not on review, you just took a test over this!)

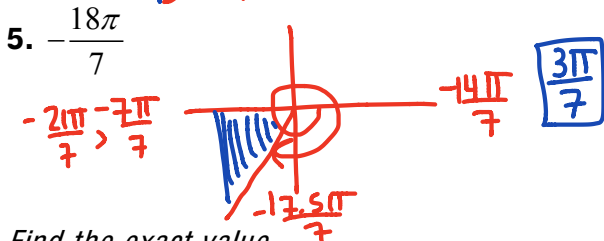
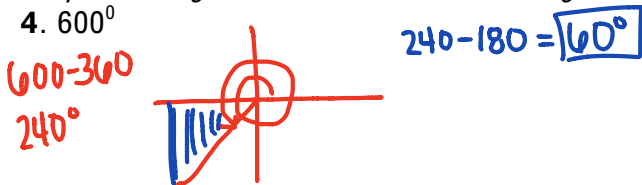
***Solve trig functions algebraically

***Model real world problem with sinusoidal functions

Unit 1- Right Triangle Trig

- Find 2 angles that are coterminal to $\frac{3\pi}{5} \pm \frac{10\pi}{5}$ $\frac{13\pi}{5}, -\frac{7\pi}{5}$ etc.
 $\pm 2\pi$ or 360°
- Convert 50° degrees to radians $50 \cdot \frac{\pi}{180} = \frac{5\pi}{18}$
- Convert $\frac{3\pi}{5}$ radians to degrees $\frac{3\pi}{5} \cdot \frac{180}{\pi} = 108^\circ$

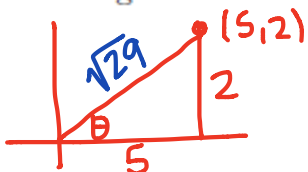
Graph the angle and find it's reference angle *ref \angle 's are always positive!*



Find the exact value

- $\sin 60^\circ = \frac{\sqrt{3}}{2}$
- $\cos \frac{3\pi}{4} = -\frac{1}{\sqrt{2}}$
- $\cot \pi = \text{undef.}$
- $\sec \frac{7\pi}{6} = -\frac{2}{\sqrt{3}}$

10. The terminal side of an angle θ in standard position passes through the point $(5, 2)$. Find the six trigonometric functions for θ . *SOH CAH TOA*



$$2^2 + 5^2 = c^2$$

$$4 + 25 = c^2$$

$$\sin \theta = \frac{2}{\sqrt{29}}$$

$$\csc \theta = \frac{\sqrt{29}}{2}$$

$$\cos \theta = \frac{5}{\sqrt{29}}$$

$$\sec \theta = \frac{\sqrt{29}}{5}$$

$$\tan \theta = \frac{2}{5}$$

$$\cot \theta = \frac{5}{2}$$

Evaluate in radians and round to the nearest hundredth

***11. $\sin 1.234$

0.944

***12. $\arcsin .743 = .838$

(2nd) sin

***13. $\sin^{-1} .323 = .329$

***14. $\csc 1.351$

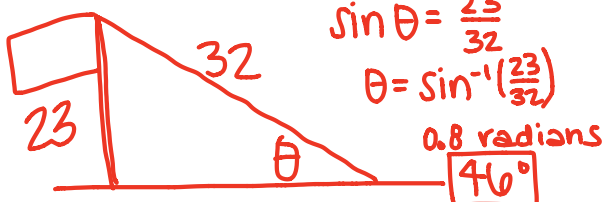
$\frac{1}{\sin 1.351} = 1.025$

***15. $\csc^{-1} 1.351 = .833$

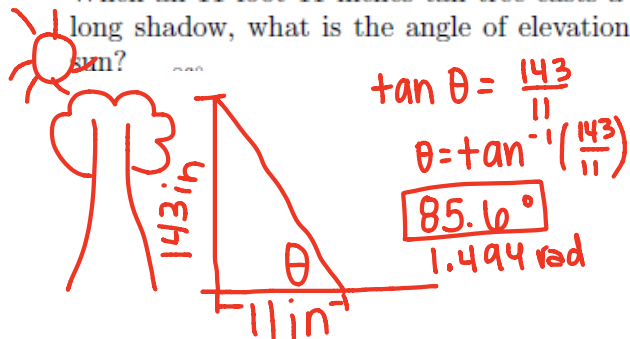
$\sin^{-1} (\frac{1}{1.351})$

***16.

A wire 32 feet long is attached to the top of a flagpole 23 feet long. Approximately what is the measure of the angle the wire makes with the ground? Round your answer to the nearest tenth



When an 11 foot 11 inches tall tree casts a 10 inch long shadow, what is the angle of elevation of the sun?

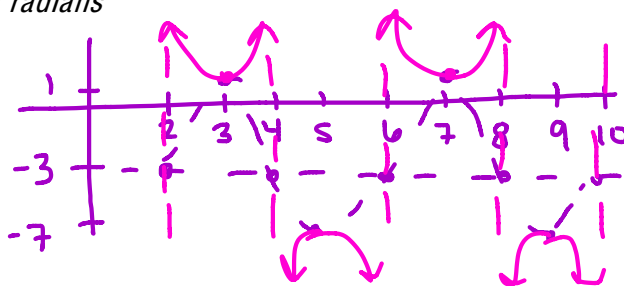


Unit 2- Graphing Trig Functions

Graph 2 cycles of the function in radians

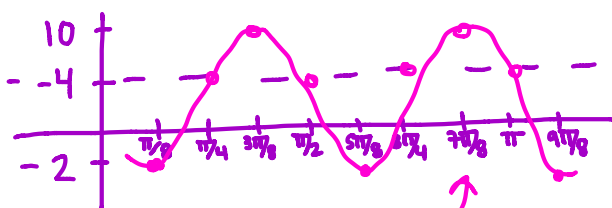
18. $y = -3 + 4 \csc \frac{\pi}{2}(x-2)$

Amp: 4
VS: -3
Per: $\frac{2\pi}{\frac{\pi}{2}} = 4$
CP: $\frac{\pi}{4} = 1$
PS: 2 mid



19. $y = 4 - 6 \cos 4\left(x - \frac{\pi}{8}\right)$
reflect

Amp: 6
VS: 4
Per: $\frac{2\pi}{4} = \frac{\pi}{2}$
CP: $\frac{\pi}{2} \div 4 = \frac{\pi}{8}$
PS: $\frac{\pi}{8}$ (low)



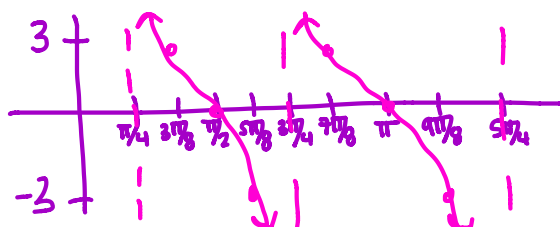
20. $y = 3 + \tan\left(x + \frac{\pi}{4}\right)$

+tan: per is pi!
Amp: 1
VS: 3
CP: $\frac{\pi}{4}$
PS: $-\pi/4$ (mid)



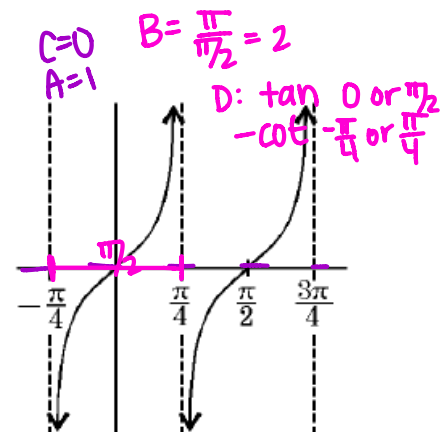
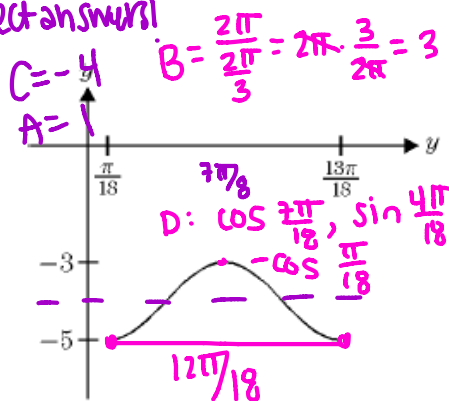
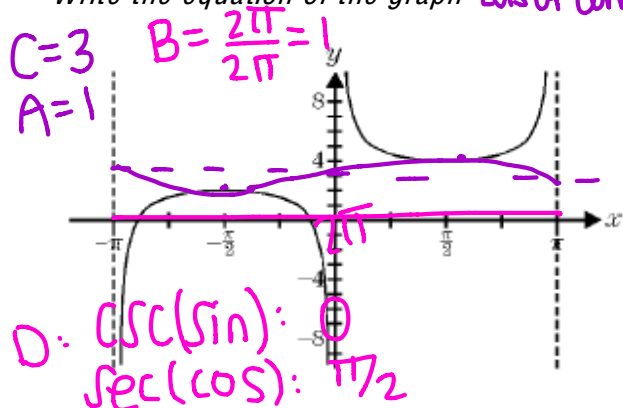
21. $y = 3 \cot 2\left(x - \frac{\pi}{4}\right)$

Amp: 3
VS: none
(midpoint on x-axis)
Per: $\frac{\pi}{2}$
CP: $\frac{\pi}{8}$
PS: $\frac{\pi}{4}$ (asympt)



Write the equation of the graph

Lots of correct answers!



22. $y = 3 + \csc x$
 $y = 3 + \sec(x - \pi/2)$

23. $y = -4 + \cos 3\left(x - \frac{7\pi}{18}\right)$
 $y = -4 + \sin 3\left(x - \frac{4\pi}{18}\right)$

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

25. Consider the function $y = -4 - 3 \sin 2\left(x - \frac{\pi}{3}\right)$.

Without actually graphing the function, write an explanation of how the constants -4 , -3 , 2 , and $\frac{\pi}{3}$ affect the graph, using the graph of $y = \sin x$ as a basis for comparison.

-4 : C (VS)
affects sinusoidal axis (where middle points are)

-3 : A (Amp)
the negative reflects the graph and the 3 stretches the graph

2 : B (Period)
affects period length (horizontal compression)
A full cycle will happen every $\frac{2\pi}{2} = \pi$ radians.

$\frac{\pi}{3}$: D (PS)
affects where the first x will start (horizontal shift)
moves the graph $\pi/3$ to the right.

QI $0, \pi$ \cos
 QII $-\pi/2, \pi/2$ \sin
 QIII \cot \tan
 QIV \csc \sec

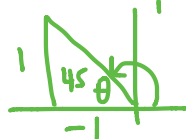
Unit 3- Inverses

Find the principal inverse value

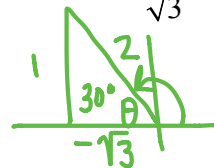
26. $\cos^{-1} \frac{1}{\sqrt{2}}$ 45° or $\frac{\pi}{4}$



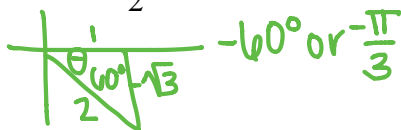
27. $\cot^{-1}(-1)$ QII 135° or $\frac{3\pi}{4}$



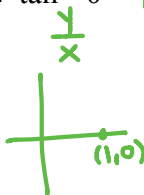
28. $\sec^{-1} -\frac{2}{\sqrt{3}}$ QII 150° or $\frac{5\pi}{6}$



29. $\sin^{-1} -\frac{\sqrt{3}}{2}$ QIV -60° or $-\frac{\pi}{3}$



30. $\tan^{-1} 0$ inverse → inside OI O chart 0° or 0 rad.

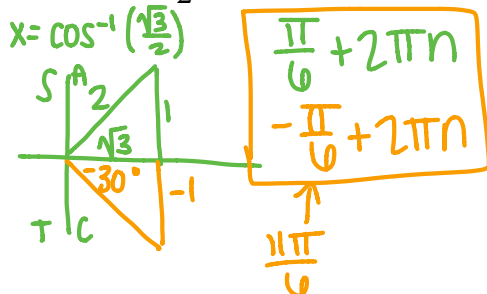


	S	C	T
0	1	0	0
$\pi/2$	0	1	0
π	0	-1	0
$3\pi/2$	-1	0	0

← not in RR

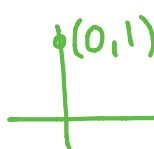
Find the general solution to the equation (eg answer)

31. $\cos x = \frac{\sqrt{3}}{2}$ cos + in QI, QIV



32. $\sin x = 1$

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



	S	C	T
0	0	1	0
$\pi/2$	1	0	0
π	0	-1	0
$3\pi/2$	-1	0	0

Find the exact value or an equivalent algebraic expression

33. $\tan\left(\sin^{-1}\left(\frac{3}{5}\right)\right)$



$x^2 + 3^2 = 5^2$
 $x^2 = 16$

36. $\tan^{-1}(\cos 0)$

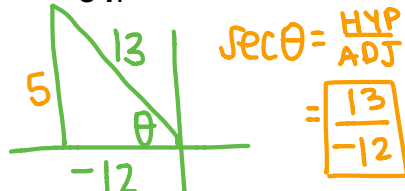


$\tan^{-1}(1)$ QI



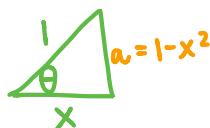
45° or $\frac{\pi}{4}$

34. $\sec\left(\cos^{-1}\left(-\frac{12}{13}\right)\right)$



$(-12)^2 + x^2 = 13^2$
 $x^2 = 25$

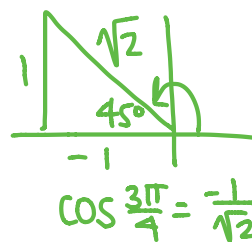
37. $\sin(\cos^{-1} x)$ $\cos = \frac{adj}{hyp}$



$x^2 + a^2 = 1^2$
 $a^2 = 1 - x^2$
 $a = \sqrt{1 - x^2}$

$\sin \theta = \frac{opp}{hyp} = \frac{\sqrt{1-x^2}}{1}$

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



$\sin^{-1}(-\frac{1}{\sqrt{2}})$ QIV
-45° or $-\frac{\pi}{4}$

38. $\sin(\arctan 3x)$ $\tan \theta = \frac{opp}{adj}$



$1^2 + (3x)^2 = c^2$
 $1 + 9x^2 = c^2$
 $\sqrt{1+9x^2} = c$

$\sin \theta = \frac{opp}{hyp} = \frac{3x}{\sqrt{1+9x^2}}$