Precalculus Exam #3

Name _____ **Banner** _____

Note Title 6/24/2006

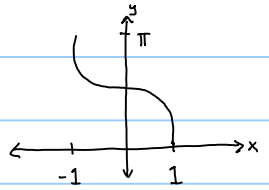
✱ Follow these instructions or receive a zero.

Use a #2 pencil for the following:

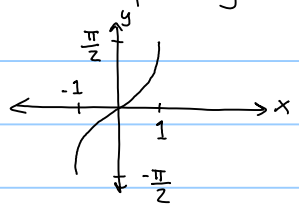
1. Write your name on your parscore.
2. Fill in your banner ID, leaving out the @ symbol. Start from the left and go to the right. Be sure to fill in the corresponding bubbles.
3. This is Test Form A. Fill in this bubble under "Exam Form" on your parscore.
4. Make sure you've written your name and banner on this exam at the top of this page.
5. As you take the exam, circle your answers on this test as well as fill in the corresponding bubbles on your parscore.
6. Feel free to write on this exam and to use the scratch paper attached.
7. **There can be more than one answer. This means you can fill in more than one bubble if necessary.**
8. Don't cheat. Read these instructions again to make sure you know what you're doing. Work the easy problems first. Cover your work!

Note: Remember $\sin^{-1}(x) \neq \frac{1}{\sin(x)}$ and $\sin^{-1}(x)$ is also called/written $\arcsin(x)$. This applies to the others too.

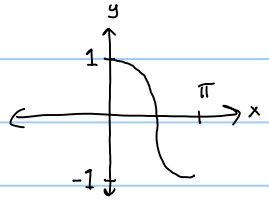
#1 Which of the following are completely true?

a) 

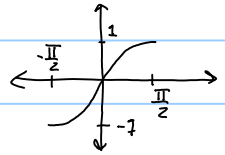
is a graph of $\sin^{-1}(x)$

b) 

is a graph of $\cos^{-1}(x)$

c) 

is a graph of $\cos^{-1}(x)$

d) 

is a graph of $\sin^{-1}(x)$

e) None of the above

#2 Which of the following are completely true?

a) $\mathbb{R} \to \sin(x) \to [-1,1] \to \arcsin(x) \to [0,\pi]$

b) $\mathbb{R} \to \sin(x) \to (-1,1) \to \arcsin(x) \to [-\frac{\pi}{2}, \frac{\pi}{2}]$

c) $\mathbb{R} \to \cos(x) \to [-1,1] \to \arccos(x) \to [0,\pi]$

d) $[-1,1] \to \sin(x) \to [0,\pi] \to \arcsin(x) \to \mathbb{R}$

e) None of the above

#3 Which of the following are completely true?

a) $\sin^{-1}(\sin(\frac{7\pi}{4})) = \frac{7\pi}{4}$ because $\frac{7\pi}{4}$ is on the right half of the unit circle

b) $\sin^{-1}(\sin(\frac{7\pi}{4})) = -\frac{\pi}{4}$ because $\sin(\frac{7\pi}{4}) = \sin(-\frac{\pi}{4})$ and the range of $\sin^{-1}(x)$ is $[-\frac{\pi}{2}, \frac{\pi}{2}]$

c) $\sin(\sin^{-1}(\frac{\pi}{2})) = \frac{\pi}{2}$

d) $\sin(\sin^{-1}(\frac{\sqrt{3}}{2})) = 60°$

e) None of the above

#4 Which of the following are completely true?

a) $\cos(\cos^{-1}(\frac{\pi}{2})) = \frac{\pi}{2}$

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

c) $\cos^{-1}(\cos(\frac{9\pi}{4})) = \frac{\pi}{4}$

d) $\cos^{-1}(\cos(-\frac{\pi}{4})) = -\frac{\pi}{4}$

e) None of the above

#5 Which of the following are completely true?

a) If $f(x) = y$ has one output per one input then it passes the vertical line test and is a function.

b) If a function has multiple inputs that give the same output then it passes the horizontal line test and has an inverse

c) If a function passes the horizontal line test, then it has an inverse that can be seen by folding the graph of $f(x)$ over the line $y = x$.

d) Only $\tan(x)$ has a perfect unrestricted inverse

e) None of the above

#6 Which of the following are completely true?

a) $\tan(\sin^{-1}(\frac{1}{3})) = \frac{\sqrt{2}}{4}$

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

c) $\sin^{-1}(\cos(\frac{3\pi}{4})) = \cos^{-1}(\sin(\frac{3\pi}{4}))$

d) $\cot^{-1}(1) = \tan^{-1}(1)$

e) None of the above

#7 Which of the following are completely true?

a) $\sin(\tan^{-1}(\frac{1}{2})) = \frac{1}{\sqrt{5}}$

b) $\sin(\tan^{-1}(\frac{1}{2})) = \frac{-\sqrt{5}}{5}$

c) $\sin(\tan^{-1}(\frac{1}{2})) = -\frac{1}{\sqrt{5}}$

d) $\sin(\tan^{-1}(\frac{1}{2})) = \frac{1}{5}$

e) None of the above

#8 $\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta} =$

a) $2\csc\theta$ b) $\frac{2}{\sin\theta}$ c) $2\frac{\cot\theta}{\cos\theta}$ d) $\frac{1}{2}\csc\theta$ e) None of the above

#9 $(1-\cos^2\theta)(1+\cot^2\theta) =$

a) $\sin\theta\csc\theta$ b) $\sin^2\theta$ c) 1 d) $\cos^2\theta$ e) None of the above

#10 $1 - \frac{\sin^2\theta}{1+\cos\theta} =$

a) $\sin\theta$ b) $\cos\theta$ c) $\frac{1}{\csc\theta}$ d) $\frac{\tan\theta\cot\theta}{\sec\theta}$ e) None of the above

#11 $\frac{\sec\theta}{\csc\theta} + \frac{\sin\theta}{\cos\theta} =$

a) $2\cot\theta$ b) $2\tan\theta$ c) $(2\sin^2\theta + 2\cos^2\theta)(\frac{\sin\theta}{\cos\theta})$ d) 1

e) None of the above

#12 $\frac{1+\tan\theta}{1+\cot\theta} =$

a) $\cot\theta$ b) $\frac{1}{(\frac{1}{\tan\theta})}$ c) $\tan\theta$ d) $\frac{1}{(\frac{1}{\cot\theta})}$ e) None of the above

#13 ✱ Extra Credit

The set of even numbers has fundamentally different properties then the odd numbers because

a) The odd numbers are closed under addition

b) The even numbers have an additive identity but the odd numbers don't

c) There are twice as many even numbers as odd numbers because all even numbers are divisible by 2 but all odd numbers are only divisible by 1 and 2 is twice as much as 1.

d) Only the evens have an additive inverse.

e) None of the a bove