

PRECALCULUS EXAM #2

NAME _____

BANNER _____

Note Title

6/17/2006

★ 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!

#1 Which of the following are completely true?

- a) If you flip the graph of an odd function over the x -axis it will look the same as if you flipped it over the y -axis
- b) If you flip the graph of an even function over the y -axis it will look the same as the original function.
- c) letter (a) above is exemplified by the fact that $\sin(-x) = -\sin(x)$ where $\sin(-x)$ represents flipping $\sin(x)$ over the y -axis and $-\sin(x)$ represents flipping $\sin(x)$ over the x -axis
- d) Although $-\sin(-x)$ flips the graph of $\sin(x)$ over the x -axis and then the y -axis (or vice versa), it can also be thought of as flipping $\sin(x)$ over the x -axis twice or the y -axis twice. This is one way to think about the fact that $-\sin(-x) = \sin(x)$
- e) None of the above

#2 Which of the following are completely true?

- a) There are two even and four odd trig functions
- b) The identity $\cos(\frac{\pi}{2}-x) = \sin(x)$ shows that although $\cos(x)$ is even, its shifted version, $\cos(\frac{\pi}{2}-x)$ is an odd function.
- c) Adding even functions produces an odd function.
- d) Multiplying even functions produces an odd function.
- e) None of the above

#3 Which of the following are completely true?

- a) Although $\sin(x)$ is 2π periodic, $\sin(4x)$ has 4 times as many periods as $\sin(x)$ and is therefore $2\pi \cdot 4 = 8\pi$ periodic
- b) The period of $\sin(wx)$ is $T = \frac{2\pi}{w}$ but the period of $\tan(wx)$ is $T = \frac{\pi}{w}$ because $\tan(x)$ is π periodic
- c) If $w > 1$ it makes the graph look horizontally compressed but if $w < 1$ it stretches it horizontally.
- d) $3\sin(3x)$ has a graph 3 times as tall and a period 3 times as long as the graph of $\sin(x)$
- e) None of the above

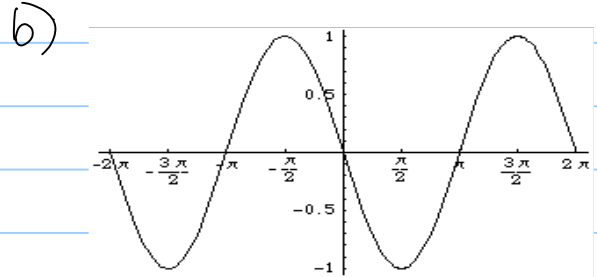
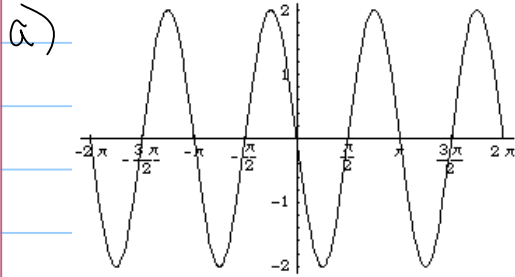
#4 Which of the following are completely true?

- a) If $\cos x > 0$ then $\cos x = \sqrt{1 - \sin^2 x}$
- b) $\cos(x - \frac{\pi}{2}) = \cos[-(\frac{\pi}{2} - x)] = \cos(\frac{\pi}{2} - x) = \sin(x)$
- c) $\cos(2x + \pi)$ is a shift of $\cos x$ to the left by $\frac{\pi}{2}$, not π , since $\cos(2x + \pi) = \cos[2(x + \frac{\pi}{2})]$ reveals that the amount being added to your x variable is $\frac{\pi}{2}$, not π , which is what is added to $2x$.
- d) Choice (c) is an example of phase shift defined by ϕ/w
- e) None of the above

#5 Which of the following are completely true?

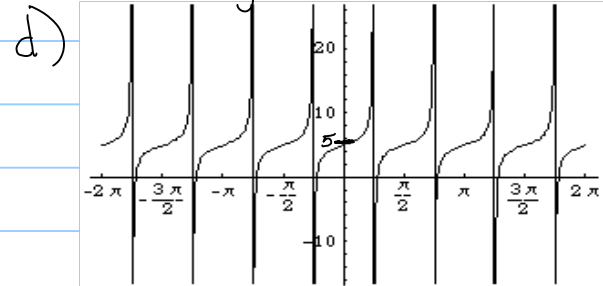
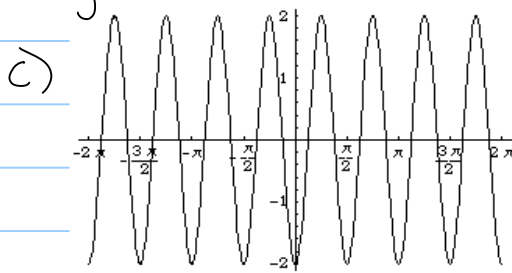
- a) $\cos(x - \frac{17\pi}{2}) = \cos(x - 8\pi - \frac{\pi}{2}) = \cos(x - \frac{\pi}{2}) = \sin(x)$
- b) $\sin(3x + \frac{16\pi}{3}) = \sin(3x + 8 \cdot \frac{2\pi}{3}) = \sin(3x)$
- c) When going around the unit circle clockwise instead of counter-clockwise, the x -values are the same as if going counter-clockwise. This is one way to reason why $\cos(-\theta) = \cos\theta$
- d) $\tan(\frac{\pi}{2} - x) = \cot x$ and $\sec(\frac{\pi}{2} - x) = \csc(x)$
- e) None of the above

#6 Which of the following are completely true?



is a graph of $f(x) = 2\sin(2x - \pi)$

is a graph of $f(x) = \sin(x - \pi)$

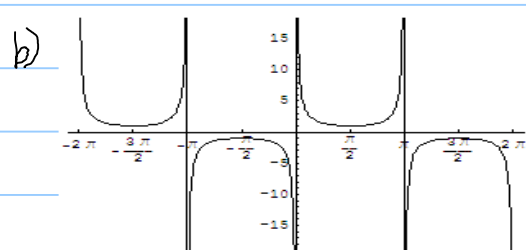
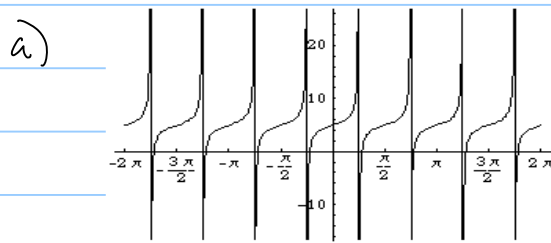


is a graph of $f(x) = 2\cos(2x - \pi)$

is a graph of $f(x) = \tan(2x + 5)$

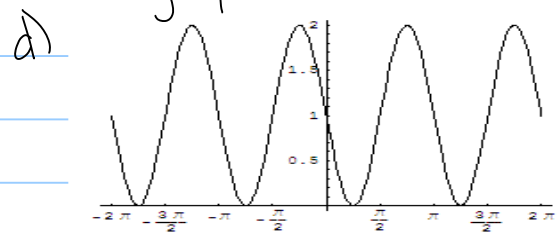
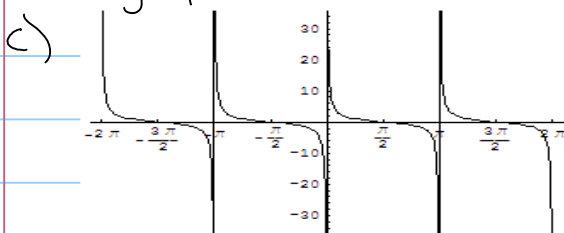
e) None of the above

#7 Which of the following are completely true?



is a graph of $\sec(x)$

is a graph of $\csc(x)$

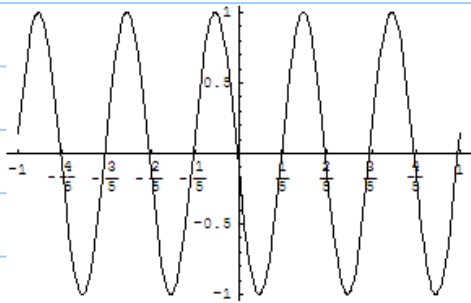


is a graph of $\cot(x)$

this function has an amplitude $A = 2$

e) None of the above

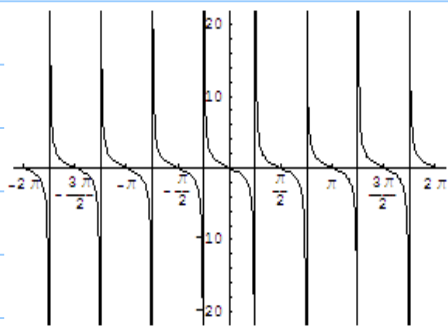
#8



is a graph of which of the following functions?

- a) $\sin\left(\frac{\pi x}{5}\right)$
- b) $-\sin(5\pi x)$
- c) $\sin(5\pi x - 3)$
- d) $\sin(5\pi x - 5)$
- e) None of the above

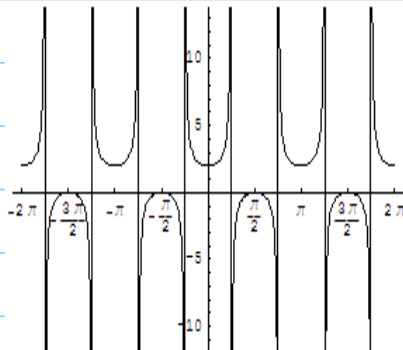
#9



is a graph of which of the following functions?

- a) $\cot(2x)$
- b) $\tan(-2x)$
- c) $-\tan(2x)$
- d) $-\tan(2x - \pi)$
- e) None of the above

#10



is a graph of which of the following functions?

- a) $\sec(2x)$
- b) $\sec(x) + 1$
- c) $\sec(2x + 1)$
- d) $2\sec(x)$
- e) None of the above

#11

Bonus The graph of $f(x) = x^2 + 2x + 1$

- a) is a shift of the graph of $f(x) = x^2$ by 1 up
- b) is a shift of the graph of $f(x) = x^2$ by 1 to the left
- c) has even symmetry
- d) Would have even symmetry if it was shifted to the right by 1.
- e) None of the above