

★ 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 true?

- a) $\sin(-25\pi) = \sin(113\pi)$ b) $\sin(\theta - 5\pi) = \sin(\theta - 11\pi)$
 c) $\tan(2x) = \cot(x/2)$ d) $\cos(\theta + \pi) = \cos(\theta - \pi)$
 e) $\sin(-\frac{24}{17}) = -\sin(\frac{24}{17})$

#2 Which of the following are true?

- a) $\sin \theta$ is 2π periodic b) $\cos \theta = \sin(\frac{\pi}{2} - \theta)$
 c) $\tan \theta$ is 2π periodic d) $\cot \theta$ has a period of 180°
 e) $\tan(3\theta - \pi/2)$ is $\frac{2\pi}{3}$ periodic

#3 Which of the following are true?

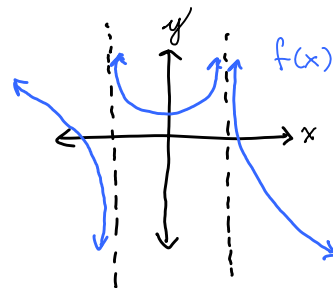
- a) π is a rational number b) $S = r\theta$ where θ is in degrees
c) $\tan^2\theta = \sec^2\theta + 1$ is a pythagorean identity
d) I drop your 2 lowest exam grades e) $(\sin^2\theta - 1)\tan^2\theta = -\sin^2\theta$

#4 Which of the following are true?

- a) If the radius of a spinning bicycle tire is 5 cm then the tire's circumference is 25π cm.
b) The area of a sector of a circle is $\pi r\theta$
c) $\sin\theta = \frac{y}{r} = \frac{1}{\sec\theta}$ d) angular velocity $\omega = r\theta$ e) $\pi = 3.14\dots$

#5 The symmetry of the function $f(x)$ is

- a) odd b) even c) both
d) neither e) this is not a function



#6 If the radius of a ferris wheel is 35 meters and one ride lasts 10 minutes, how fast does the ferris wheel have to spin for a rider to go 350π meters?

- a) $70\pi \frac{\text{meters}}{\text{min}}$ b) $1 \frac{\text{rev}}{\text{min}}$ c) $70 \frac{\text{meters}}{\text{min}}$ d) $\frac{1}{2} \frac{\text{rev}}{\text{min}}$
e) $\pi \frac{\text{rad}}{\text{min}}$

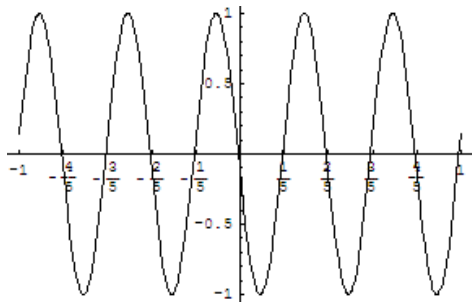
#7 Which of the following are true?

- a) $\pi^\circ = 180$ radians b) $2\pi \text{ rad} = 360^\circ$ c) $60^\circ 6' = 60.1^\circ$
d) $\pi \approx 3.14\dots$ degrees e) $\sin(\frac{\pi}{4}) = \cos(\frac{\pi}{4}) = \frac{1}{\sqrt{2}}$

#8 $\sin(150^\circ) =$

- a) $\sin(30^\circ)$ b) $\cos(60^\circ)$ c) $-\cos(300^\circ)$
d) $-\sin(330^\circ)$ e) $\tan(90^\circ)$

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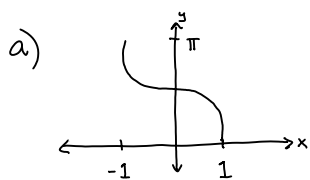


is a graph of which of the following functions?
 a) $\sin(\frac{\pi x}{5})$ b) $-\sin(5\pi x)$
 c) $\sin(5\pi(x-3))$ d) $\sin(5\pi x - 5)$
 e) $\sin(5\pi x - \pi)$

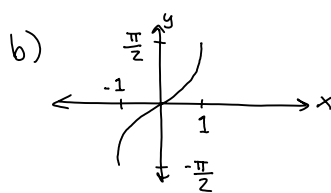
10 Which of the following are completely true?

- 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 visualize the fact that $-\sin(-x) = \sin(x)$
- e) $[\sin^2 x + \cos x] \tan x$ is an even function

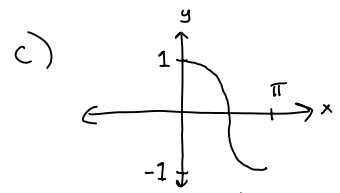
11 Which of the following are completely true?



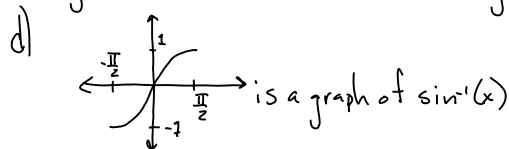
is a graph of $\sin^{-1}(x)$



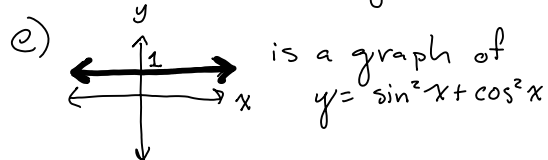
is a graph of $\cos^{-1}(x)$



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



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



is a graph of $y = \sin^2 x + \cos^2 x$

12 Which of the following are completely true?

- a) $\mathbb{R} \rightarrow \sin(x) \rightarrow [-1, 1] \rightarrow \arcsin(x) \rightarrow [0, \pi]$
- b) $\mathbb{R} \rightarrow \sin(x) \rightarrow (-1, 1) \rightarrow \arcsin(x) \rightarrow [-\frac{\pi}{2}, \frac{\pi}{2}]$
- c) $\mathbb{R} \rightarrow \cos(x) \rightarrow [-1, 1] \rightarrow \arccos(x) \rightarrow [0, \pi]$
- d) $[-1, 1] \rightarrow \sin(x) \rightarrow [0, \pi] \rightarrow \arcsin(x) \rightarrow \mathbb{R}$
- e) $\sin(\tan^{-1}(v)) = \frac{v}{\sqrt{1+v^2}}$

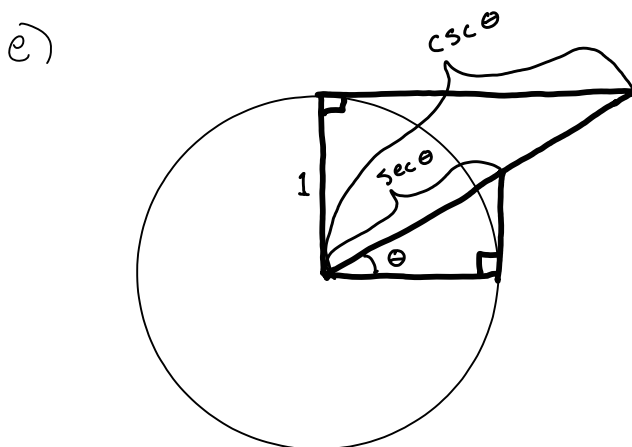
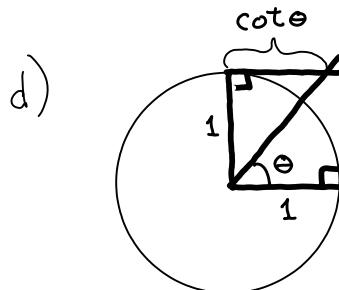
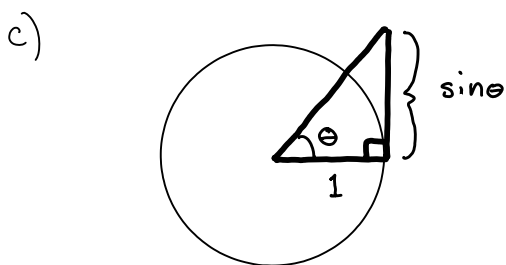
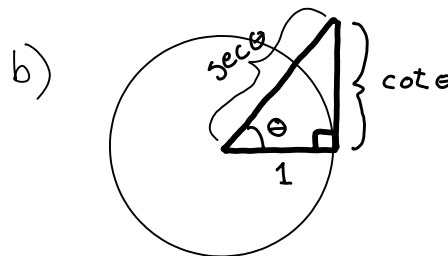
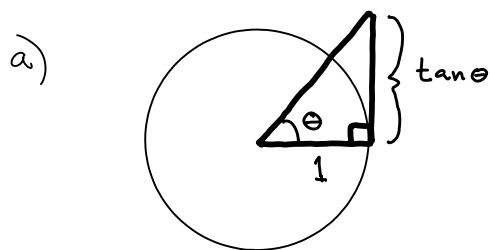
#13 $\frac{\sin\theta}{1+\cos\theta} - \frac{1-\cos\theta}{\sin\theta} =$

- a) $2\csc\theta$ b) 0 c) $2\sin\theta$ d) $\tan\theta - \frac{1}{\cot\theta}$ e) $\sin^2\theta - (\cos^2\theta - 1)$
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#14 $\frac{1+\tan\theta}{1+\cot\theta} =$

- a) $\tan\theta$ b) $1-\sin\theta$ c) $\cot\theta$ d) 1 e) $\tan^2\theta$
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#15 Which of the following unit circles is correctly labeled?



★ Note: Remember your Pythagorean identities. There are 3 of them.