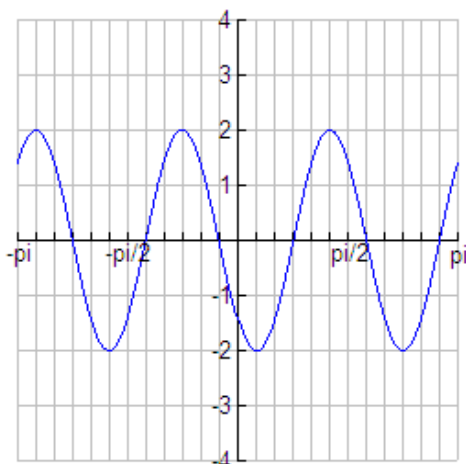


1. Which statement is false?

- a. $\cos(-\alpha) = \cos(\alpha)$
- b. $\cot^2 \beta + 1 = \csc^2 \beta$
- c. $\sin(x + y) = \sin x \cos y - \cos x \sin y$
- d. $\sin 2\phi = 2 \sin \phi \cos \phi$
- e. $-\sin(\phi) = \sin(-\phi)$

2. Which function of the form $f(x) = a \sin k(x - b) + c$ could the graph shown be?



- a. $f(x) = 2 \sin 3\left(x - \frac{\pi}{4}\right)$
- b. $f(x) = 4 \sin\left(x - \frac{\pi}{4}\right)$
- c. None of these
- d. $f(x) = 2 \sin 3\left(x - \frac{\pi}{3}\right)$
- e. $f(x) = 4 \sin 3\left(x - \frac{3\pi}{4}\right)$

3. What are the domain and range, respectively, of the function $f(x) = \log_{\pi}(x - 4) - 7$?

- a. None of these
- b. $[4, \infty), (-\infty, \infty)$
- c. $(4, \infty), (7, \infty)$
- d. $(4, \infty), (-\infty, \infty)$
- e. $[4, \infty), [7, \infty)$

4. In triangle ABC if $a=5$ mm, $b=12$ mm, and $A=30^\circ$, find the measure of angle B .

- a. $\sin^{-1}\left(\frac{6}{5}\right)$
- b. None of these
- c. $\sin^{-1}\left(\frac{5}{6}\right)$
- d. No such triangle exists.
- e. 72°

5. $\cot\left(\sin^{-1}\frac{-1}{4}\right)=$

- a. $\frac{-1}{4}$
- b. $-\sqrt{15}$
- c. None of these
- d. $\sqrt{15}$
- e. $-\sqrt{17}$

6. Exactly solve $6+2\log_4 x=12$ for x .

- a. 256
- b. -64, 64
- c. 81
- d. 64
- e. None of these

7. Exactly evaluate $\cos 285^\circ$.

- a. $\frac{\sqrt{2}(\sqrt{3}-1)}{4}$
- b. $\frac{\sqrt{2}(\sqrt{3}+1)}{4}$
- c. $\frac{\sqrt{2}(-\sqrt{3}+1)}{4}$
- d. None of these
- e. $\frac{-\sqrt{2}(\sqrt{3}+1)}{4}$

8. $\sin^{-1}\left(\sin \frac{11\pi}{6}\right) =$

- a. $\frac{11\pi}{6}$
- b. None of these
- c. $\frac{-\pi}{6}$
- d. Undefined
- e. $\frac{-\pi}{3}$

9. Exactly find angle A of triangle ABC if $a=2$ meters, $b=3$ meters, and $c=4$ meters.

- a. None of these
- b. $\cos^{-1}\left(\frac{11}{16}\right)$
- c. $\cos^{-1}\left(\frac{5}{24}\right)$
- d. $\cos^{-1}\left(\frac{-3}{4}\right)$
- e. $\cos^{-1}\left(\frac{7}{8}\right)$

10. Solve $2\sqrt{2}\sin x \cos x - 2\sin x - \sqrt{2}\cos x + 1 = 0$ for x .

- a. $\frac{\pi}{6} + 2n\pi, \frac{\pi}{4} + 2n\pi$ where n is an integer
- b. $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{\pi}{4}, \frac{7\pi}{4}$
- c. $\frac{\pi}{6} + 2n\pi, \frac{5\pi}{6} + 2n\pi, \frac{\pi}{4} + 2n\pi, \frac{7\pi}{4} + 2n\pi$ where n is an integer
- d. None of these
- e. $\frac{\pi}{6}, \frac{\pi}{4}$

Math 150 **NEATLY PRINT NAME:** _____

Exam 3 **STUDENT ID:** _____

Spring 2009 **DATE:** _____

Scarborough **SECTION:** **501** T 3:55-4:45 **503** T 2:20-3:10 **504** R 2:20-3:10 3 **505** T 8:00-8:50

TEST NO.: **SHOWERS**

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

Signature of student

Academic Integrity Task Force, 2004
<http://www.tamu.edu/aggiehonor/FinalTaskForceReport.pdf>

My signature in this blank allows my instructor to pass back my graded exam in class or allows me to pick up my graded exam in class on the day the exams are returned. If I do not sign the blank or if I am absent from class on the day the exams are returned, I know I must show my Texas A&M student ID during my instructor's office hours to pick up my exam.

Signature of student _____

You must clear your calculator BEFORE and AFTER the exam.
MEM (2nd +), Reset, ALL, Reset

This is a 10-question work-out exam. Each problem is worth 5 points for a total of 50 points. Write all solutions in the space provided as full credit will not be given without complete, correct accompanying work, even if the final answer is correct. Fully simplify all your answers, and give exact answers unless otherwise stated. Justify your answers algebraically whenever possible. Circle your final answer. Remember your units!

So far as Napier's invention of logarithms is concerned, Lord Moulton expressed the fact very clearly when he stated: "The invention of logarithms came on the world as a bolt from the blue. No previous work had led up to it, foreshadowed it or heralded its arrival. It stands isolated, breaking in upon human thought abruptly without borrowing from the work of other intellects or following known line of mathematical thought."

4. Verify the identity $\tan^2 x - \cot^2 x = \sec^2 x - \csc^2 x$.

5. Exactly solve $x^2 \cdot 3^x + 2x \cdot 3^x = 80 \cdot 3^x$ for x .

6. Given $c = 20\text{cm}$, $C = 18^\circ$, and $B = 44^\circ$, solve the triangle. Give the lengths of a and b to 2 decimal places and remember your units.

$A =$ _____

$a =$ _____

$b =$ _____

7. Exactly solve $\tan^2 x = \tan x$ on the interval $[0, 2\pi)$.

8. If $\cos \theta = \frac{2}{3}$ and θ is in Quadrant IV, find the *exact* values of the following trig functions.

a. $\sin \theta =$

b. $\tan \theta =$

c. $\csc \theta =$

d. $\sec \theta =$

e. $\cot \theta =$

9. Exactly solve $\log_{12}(-x-2) + \log_{12}(16-x) = 2$ for x .

10. If $f(x) = -10\sin\left(5x - \frac{3\pi}{2}\right) - 2$, what are the amplitude, period and phase shift?

Amplitude:

Period:

Phase Shift: