

RED

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Math 111 - Section 1 (J. Tay)

Test 3

May 31 - Jun 2, 2012

1. Find the value of $\cos^{-1}(-1)$.

- A. $-\pi$ B. $\frac{\pi}{2}$ C. π D. 0 E. 2π

2. Find the value of $\sin^{-1}\left(\sin \frac{5\pi}{4}\right)$.

- A. $\frac{7\pi}{4}$ B. $\frac{5\pi}{4}$ C. $\frac{3\pi}{4}$ D. $\frac{\pi}{4}$ E. $-\frac{\pi}{4}$

3. Solve the equation for x . $\frac{\csc^{-1} x}{\pi} = \frac{1}{6}$.

- A. 2 B. $\sqrt{2}$ C. 1 D. 0 E. -1

4. What is the domain of $\sec^{-1} x$?

- A. $0 \leq x \leq \pi$
B. $x \neq k\pi$, where k is an integer
C. $x \neq \frac{\pi}{2} + k\pi$, where k is an integer
D. $x \geq -1, x \leq 1$
E. $x \geq 1, x \leq -1$

5. Evaluate $\tan\left[\cos^{-1}\left(\frac{1}{2}\right)\right]$.

- A. 2 B. $\sqrt{3}$ C. $\frac{\sqrt{3}}{2}$ D. $\frac{1}{\sqrt{3}}$ E. $\frac{1}{2}$

6. Evaluate $\sin\left[\cos^{-1}\left(-\frac{3}{5}\right)\right]$.

- A. $\frac{3}{4}$ B. $-\frac{3}{4}$ C. $\frac{4}{5}$ D. $-\frac{4}{5}$ E. $\frac{5}{4}$

7. Which of the following is equal to $\frac{\csc \theta}{\sec \theta}$?

- A. $\sin \theta$ B. $\tan \theta$ C. $\frac{1}{\cot \theta}$ D. $\cot \theta$ E. $\sin^2 \theta$

8. Given that $0 \leq \theta \leq \frac{\pi}{2}$. Which of the following is equal to $\sin \theta$?

- A. $\frac{\cos^2 \theta - 1}{\cos \theta + 1} + 1$ B. $\frac{\cos^2 \theta - 1}{\cos \theta - 1} + 1$ C. $\frac{\sin^2 \theta - 1}{\cos \theta + 1} + 1$
D. $\frac{\sin^2 \theta - 1}{\sin \theta - 1} + 1$ E. $\frac{\sin^2 \theta - 1}{\sin \theta + 1} + 1$

9. Write $\cos(\sin^{-1} u)$ as an algebraic expression in u .

- A. $\frac{1}{\sqrt{1-u^2}}$ B. $-\sqrt{1-u^2}$ C. $\sqrt{u^2-1}$
D. $\sqrt{1-u^2}$ E. $\frac{u}{\sqrt{1-u^2}}$

10. Which of the following is equal to $1 + \tan^2(-\theta)$?

- A. $\sec^2 \theta$ B. $\cos^2 \theta$ C. $-\csc^2 \theta$ D. $-\cot^2 \theta$ E. $-\sin^2 \theta$

11. Use a sum or difference formula to find the value of $\cos 75^\circ$.

- A. $\frac{\sqrt{6} + \sqrt{2}}{4}$ B. $\frac{\sqrt{6} - \sqrt{2}}{4}$ C. $\frac{-\sqrt{6} - \sqrt{2}}{4}$
D. $\frac{\sqrt{2} - \sqrt{6}}{4}$ E. $\frac{\sqrt{3} - \sqrt{2}}{4}$

12. Evaluate the expression $\sin 45^\circ \cos 15^\circ - \sin 15^\circ \cos 45^\circ$.

- A. -1 B. $-\frac{1}{2}$ C. $\frac{\sqrt{2}}{2}$ D. $\frac{1}{2}$ E. 0

13. Use a sum or difference formula to find the value of $\tan \frac{7\pi}{12}$.

- A. $\frac{1 + \sqrt{3}}{1 - \sqrt{3}}$ B. $1 + \sqrt{3}$ C. $\sqrt{3}$ D. $\frac{1 - \sqrt{3}}{1 + \sqrt{3}}$ E. $1 - \sqrt{3}$

14. Given that $\cos \theta = \frac{1}{3}$. Find the value of $\cos 2\theta$.

- A. $-\frac{7}{9}$ B. $\frac{8}{9}$ C. $-\frac{1}{3}$ D. $-\frac{2}{3}$ E. $-\frac{8}{9}$

15. Which of the following is equal to $\sin^2 \theta$?

- A. $1 - \cos 2\theta$ B. $1 + \cos 2\theta$ C. $\frac{1}{2}(1 - \cos 2\theta)$
D. $\frac{1}{2}(1 + \cos 2\theta)$ E. $1 - \sin 2\theta$

16. A sum-to-product formula is $\sin \alpha + \sin \beta = 2 \sin \frac{\alpha + \beta}{2} \cos \frac{\alpha - \beta}{2}$. Which of the following identities most directly proves this formula?

A. $\sin \alpha \sin \beta = \frac{1}{2} [\cos(\alpha - \beta) - \cos(\alpha + \beta)]$

B. $\sin \alpha \cos \beta = \frac{1}{2} [\sin(\alpha - \beta) + \sin(\alpha + \beta)]$

C. $\cos \alpha \cos \beta = \frac{1}{2} [\cos(\alpha - \beta) + \cos(\alpha + \beta)]$

D. $\cos \alpha + \cos \beta = 2 \cos \frac{\alpha + \beta}{2} \cos \frac{\alpha - \beta}{2}$

E. $\cos \alpha - \cos \beta = -2 \sin \frac{\alpha + \beta}{2} \sin \frac{\alpha - \beta}{2}$

17. Determine the total number of solutions for $\sin^2 \theta = 1/5$ on the interval $[0, 2\pi)$.

A. 0

B. 4

C. 3

D. 2

E. 1

18. Which of the following **IS NOT** a solution for $2 \sin(2\theta - \frac{\pi}{2}) = 1$ on the interval $[0, 2\pi)$?

A. $\frac{\pi}{3}$

B. $\frac{4\pi}{3}$

C. $\frac{5\pi}{3}$

D. $\frac{5\pi}{6}$

E. $\frac{4\pi}{6}$

19. Determine the total number of solutions for $\sin(2\theta) \sin \theta = \cos \theta$ on the interval $[0, 2\pi)$.

A. 6

B. 4

C. 3

D. 2

E. 1

20. Which of the following **IS** a solution for $\sin^2 \theta = 6(\cos \theta + 1)$ on the interval $[0, 2\pi)$?

A. 0

B. $\frac{\pi}{2}$

C. π

D. $\frac{3\pi}{2}$

E. 2π

1. C
2. E
3. A
4. E
5. B
6. C
7. D
8. E
9. D
10. A
11. B
12. D
13. A
14. A
15. C
16. B
17. B
18. D
19. A
20. C