

For #1-2, find the exact value of each expression.

1. $\cos\left(\frac{\pi}{4} + \frac{\pi}{3}\right)$

2. $\sin(135^\circ - 30^\circ)$

3. Find the exact values of the sine, cosine, and tangent of the angle: $195^\circ = 225^\circ - 30^\circ$

For #4-5, write the expression as the sine, cosine, or tangent of an angle.

4. $\cos 60^\circ \cos 10^\circ - \sin 60^\circ \sin 10^\circ$

5. $\frac{\tan 325^\circ - \tan 116^\circ}{1 + \tan 325^\circ \tan 116^\circ}$

For #6-8, find the exact value of the expression.

6. $\sin \frac{\pi}{12} \cos \frac{\pi}{4} + \cos \frac{\pi}{12} \sin \frac{\pi}{4}$

7. $\sin 120^\circ \cos 60^\circ - \cos 120^\circ \sin 60^\circ$

8. $\cos 120^\circ \cos 30^\circ + \sin 120^\circ \sin 30^\circ$

9. Find the solution(s) of the equation in the interval $[0, 2\pi)$.

$$\cos\left(x + \frac{\pi}{4}\right) + \cos\left(x - \frac{\pi}{4}\right) = 1$$

Simplify the given expressions.

10. $2 \sin(10^\circ)\cos(10^\circ)$

11. $\cos^2(15^\circ) - \sin^2(15^\circ)$

12. $2 \sin(3x) \cos(3x)$

13. $2 \cos^2 \theta - 2 \sin^2 \theta$

14. $10 \sin(x) \cos(x)$

15. $4 \sin(2x) \cos(2x)$

16. $\cos^2(5\theta) - \sin^2(5\theta)$

17. $\frac{\sin 2x}{2 \sin x}$

Solve 18-20 on the interval $0 \leq x < 2\pi$

18. $\sin 2x \sin x = \cos x$

19. $2 \sin(x) \cos(x) = \sin(x)$

20. $\sin(2x) + 2 \cos(x) = 0$

21. Find all solutions of the equation in the interval $[0, 2\pi)$ if $\sin x \cos x = -\frac{1}{2}$

a. $\frac{3\pi}{2}, \frac{7\pi}{2}$

c. $\frac{3\pi}{4}, \frac{7\pi}{4}$

b. $\frac{5\pi}{6}, \frac{11\pi}{6}, \frac{2\pi}{3}, \frac{4\pi}{3}$

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

22. True or False. Circle your answer.

a. $\tan 110^\circ = \frac{\tan 211^\circ - \tan 101^\circ}{1 + \tan 211^\circ \tan 101^\circ}$

True or False

b. $\cos 2(30^\circ) = 1$

True or False

c. $\sin(35^\circ+20^\circ) = \sin 35^\circ + \sin 20^\circ$

True or False

d. $\cos(45^\circ - 25^\circ) = \cos 45^\circ \cos 25^\circ - \sin 45^\circ \sin 25^\circ$ True or False

e. $4\sin 2x \cos 2x = 2\sin 4x$

True or False