

Write your questions
and thoughts here!

Sum/Difference Identities

$$\sin(\alpha + \beta) =$$

$$\sin(\alpha - \beta) =$$

$$\cos(\alpha + \beta) =$$

$$\cos(\alpha - \beta) =$$

Find the exact value of the sum or difference.

$$\sin\left(\frac{\pi}{4} + \frac{5\pi}{3}\right)$$

$$\cos\left(\frac{7\pi}{4} - \frac{2\pi}{3}\right)$$

Simplify the following.

$$\sin\left(x - \frac{\pi}{6}\right)$$

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Double Angle Identities

$$\sin(2\alpha) =$$

$$\cos(2\alpha) =$$

Use trig identities to solve the trig equations for $0 \leq x \leq 2\pi$. Find exact values.

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

$$3 \cos(2x) = 2 \cos^2 x$$

3.12B Equivalent Representations of Trig Functions

AP Precalculus

3.12B Practice

Find the exact value of the sum or difference.

1. $\sin\left(\frac{5\pi}{4} + \frac{2\pi}{3}\right)$

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

3. $\cos\left(\frac{5\pi}{4} - \frac{\pi}{6}\right)$

4. $\sin\left(\frac{3\pi}{2} - \frac{4\pi}{3}\right)$

5. $\cos\left(\frac{\pi}{2} - \frac{4\pi}{3}\right)$

6. $\sin\left(\frac{11\pi}{6} + \pi\right)$

Simplify the following.

7. $\sin\left(x - \frac{5\pi}{3}\right)$

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

9. $4\sin(2x)$

Use trig identities to solve the trig equations for $0 \leq x \leq 2\pi$. Find exact values.

10. $\sin(2x) + \sin x = 0$

11. $\sin(2x) \sec x = 0$

12. $\cos(2x) = \cos^2 x$

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

14. The function f is given by $f(\theta) = \cos(2\theta)$. Which of the following expressions is equivalent to $f(\theta)$?
- (A) $2\cos\theta$
 - (B) $1 - 2\sin^2\theta$
 - (C) $1 - 2\cos^2\theta$
 - (D) $2\sin\theta\cos\theta$
15. The function g is defined by $g(x) = \sin\left(x + \frac{\pi}{3}\right)$. The solutions to which of the following equations on the interval $0 \leq x \leq 2\pi$ are the solutions to $g(x) = 1$ on the interval $0 \leq x \leq 2\pi$?
- (A) $\sin x + \sqrt{3}\cos x = 2$
 - (B) $\sin x - \sqrt{3}\cos x = 2$
 - (C) $\sqrt{3}\sin x + \cos x = 2$
 - (D) $\sqrt{3}\sin x - \cos x = 2$
16. The function f is given by $f(\theta) = \cos\left(\theta + \frac{3\pi}{2}\right)$. What is the value of $f\left(\frac{\pi}{3}\right)$?
- (A) $\frac{\sqrt{3}}{2}$
 - (B) $\frac{1}{2}$
 - (C) $-\frac{1}{2}$
 - (D) $-\frac{\sqrt{3}}{2}$
17. Given $\cos(2x) = \frac{3}{5}$ and $\frac{\pi}{2} \leq x \leq \pi$, what is the exact value of $\sin(x)$?
- (A) $\frac{2\sqrt{5}}{5}$
 - (B) $\frac{\sqrt{5}}{5}$
 - (C) $-\frac{\sqrt{5}}{5}$
 - (D) $-\frac{2\sqrt{5}}{5}$