

1. Let $g(x) = (\tan x)(\sec x)$. Rewrite $g(x)$ as a fraction involving powers of $\sin x$ and no other trigonometric functions.

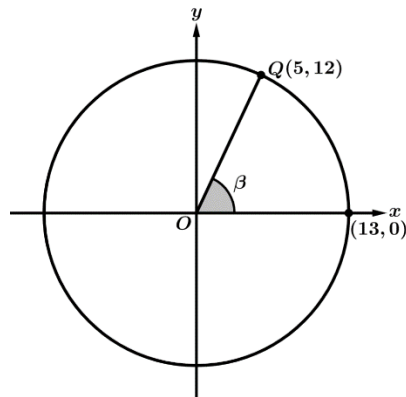
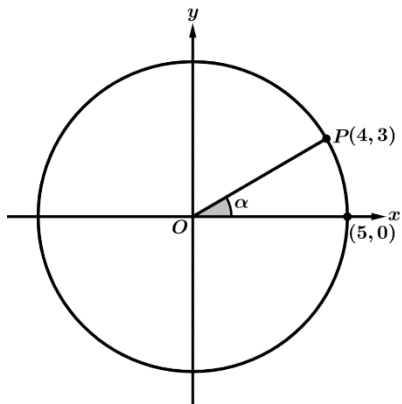
2. Let $h(x) = \frac{1 - \cos^2 x}{\cos^2 x}$. Rewrite $h(x)$ as an expression involving $\tan x$ and no other trigonometric functions.

3. Let $f(x) = \frac{1 - \sec^2 x}{\sin^2 x}$. Rewrite $f(x)$ as an expression involving $\sec x$ and no other trigonometric functions.

4. Let $k(x) = (\csc x)(\tan x)$. Rewrite $k(x)$ as an expression involving $\sec x$ and no other trigonometric functions.

5. Let $j(x) = (\sec x)(\cot x)(\tan^2 x)$. Rewrite $j(x)$ as a fraction involving powers of $\sin x$ and no other trigonometric functions.

6. Let $m(x) = \frac{(\cot x)(\cos x)}{(\csc x)}$. Rewrite $m(x)$ as a fraction involving powers of $\cos x$ and no other trigonometric functions.

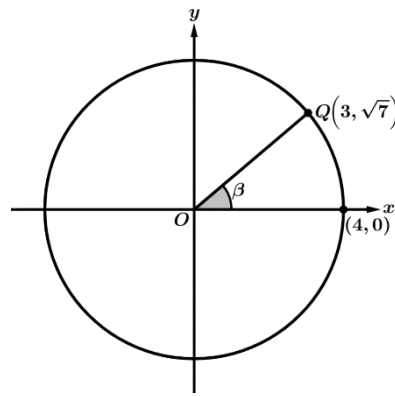
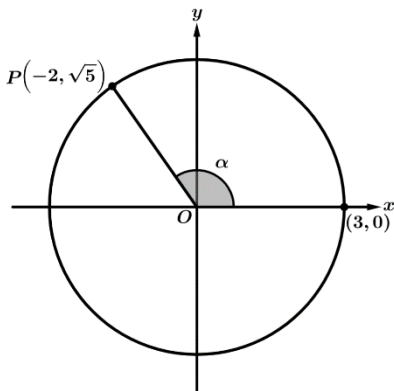


The figures show two circles centered at the origin with angle measures of α and β , respectively, in standard position. The terminal ray of angle α intersects the circle at point P , and the terminal ray of angle β intersects the circle at point Q . The coordinates of P are $(4, 3)$ and the coordinates of Q are $(5, 12)$.

7. Find $\sin(2\alpha)$.

8. Find $\sin(\alpha + \beta)$.

9. Find $\cos(\alpha - \beta)$.



The figures show two circles centered at the origin with angle measures of α and β , respectively, in standard position. The terminal ray of angle α intersects the circle at point P , and the terminal ray of angle β intersects the circle at point Q . The coordinates of P are $(-2, \sqrt{5})$ and the coordinates of Q are $(3, \sqrt{7})$.

10. Find $\cos(2\alpha)$.

11. Find $\sin(\alpha - \beta)$.

12. Find $\cos(\alpha + \beta)$.

13. Which of the following expressions is equivalent to $4\cos(2x)$?

- (A) $8\sin x \cos x$ (B) $1 - 8\cos^2 x$ (C) $4 + 8\sin^2 x$ (D) $8\cos^2 x - 4$

14. Which of the following expressions is equivalent to $(\sin x + \cos x)^2$?

- (A) 1 (B) $2\sin x \cos x$ (C) $1 + \cos(2x)$ (D) $1 + \sin(2x)$

15. Where $\cos x \neq 0$, which of the following is equivalent to $\frac{\cos^2 x - 1}{\cos^2 x}$?

- (A) $\frac{\sin^2 x}{\cos^2 x}$ (B) $\cot^2 x$ (C) $-\tan^2 x$ (D) $-\sec^2 x \csc^2 x$

16. Which of the following expressions is equivalent to $(1 + \cot^2 x)(\sin^2 x)$?

- (A) 1 (B) $\tan^2 x$ (C) $\cot^2 x$ (D) $\sin^4 x$

17. Which of the following expressions is equivalent to $3\sin(2x)$?

- (A) $3\cos^2 x - 3\sin^2 x$ (B) $(6\sin x)(6\cos x)$ (C) $6(\sin x)(\cos x)$ (D) $3 - 6\sin^2 x$

18. Which of the following expressions is equivalent to $\cos \frac{5\pi}{9} \cos \frac{3\pi}{9} - \sin \frac{5\pi}{9} \sin \frac{3\pi}{9}$?

- (A) $\cos \frac{2\pi}{9}$ (B) $\cos \frac{8\pi}{9}$ (C) $\sin \frac{2\pi}{9}$ (D) $\sin \frac{8\pi}{9}$