

Precalculus
5.1 Homework

Write each expression in terms of sines and/or cosines, and then simplify.

1. $\frac{\cot x}{\csc x}$

2. $\frac{\sin x}{\csc x} + \frac{\cos x}{\sec x}$

3. $\frac{1}{\sin^2 x} - \frac{1}{\tan^2 x}$

4. $\frac{1 + \cos \beta \tan \beta \csc \beta}{\csc \beta}$

5. $\frac{(\cos \alpha \tan \alpha + 1)(\sin \alpha - 1)}{\cos^2 \alpha}$

Use identities to find the exact values of the five remaining trigonometric functions at α .

6. $\sin \alpha = 3/4$ and $\pi/2 < \alpha < \pi$

7. $\cot \alpha = -1/3$ and $-\pi/2 < \alpha < 0$

8. $\sec \alpha = -4\sqrt{5}/5$ and α is in quadrant III

Multiply.

9. $(2 \tan \alpha + 1)(2 \tan \alpha - 1)$

10. $(3 \sin \theta + 2)^2$

11. $(2 \cos \beta + 1)(\cos \beta - 1)$

Factor completely.

12. $\tan^2 \alpha - \sec^2 \beta$

13. $\csc^4 x - \csc^2 x$

14. $\sin^2 \theta \cos \theta + \sin \theta \cos \theta - 2 \cos \theta$

15. $2 \sin^2 x - 5 \sin x - 3$

Simplify each expression.

16. $\sin(-x) \cot(-x)$

17. $\cos(y) + \cos(-y)$

18. $\frac{\sin(x)}{\cos(-x)} - \frac{\sin(-x)}{\cos x}$

19. $(1 + \sin(\alpha))(1 + \sin(-\alpha))$

$$20. \sin \beta \cos(-\beta) \csc(-\beta)$$

$$21. 1 - \frac{1}{\cos^2 x}$$

$$22. \frac{\sin^2 \alpha - \cos^2 \alpha}{1 - 2\cos^2 \alpha}$$

$$23. 1 - \frac{\sec^2 x}{\tan^2 x}$$

$$24. \sin x + \frac{\cos^2 x}{\sin x}$$

$$25. \frac{\sin^4 x - \sin^2 x}{\sec x}$$