

Precalculus
5.3 Homework
Odd Answers

$$1. \frac{\sqrt{6}-\sqrt{2}}{4}$$

$$3. \frac{-\sqrt{3}+1}{1+\sqrt{3}}$$

$$5. \frac{-\sqrt{3}-1}{1-\sqrt{3}}$$

$$7. \frac{\sqrt{2}}{2}$$

$$9. \tan\left(\frac{5\pi}{18}\right)$$

$$11. \frac{\sqrt{3}}{2}$$

$$13. -\sin \alpha$$

$$15. -\frac{63}{65}$$

$$17. \frac{\sqrt{15}+2}{6}$$

$$\begin{aligned} 19. \frac{\sin(x+y)}{\sin x \cos y} &= \frac{\sin x \cos y + \cos x \sin y}{\sin x \cos y} \\ &= \frac{\sin x \cos y}{\sin x \cos y} + \frac{\cos x \sin y}{\sin x \cos y} \\ &= 1 + \cot x \tan y \end{aligned}$$

$$\begin{aligned} 21. \frac{\cos(x+y)}{\cos x \cos y} &= \frac{\cos x \cos y - \sin x \sin y}{\cos x \cos y} \\ &= \frac{\cos x \cos y}{\cos x \cos y} - \frac{\sin x \sin y}{\cos x \cos y} \\ &= 1 - \tan x \tan y \end{aligned}$$

23.

$$\begin{aligned} \frac{1 + \tan \alpha \tan \beta}{\tan \alpha + \tan \beta} &= \frac{1 + \frac{\sin \alpha \sin \beta}{\cos \alpha \cos \beta}}{\frac{\sin \alpha}{\cos \alpha} + \frac{\sin \beta}{\cos \beta}} \\ &= \left(\frac{1 + \frac{\sin \alpha \sin \beta}{\cos \alpha \cos \beta}}{\frac{\sin \alpha}{\cos \alpha} + \frac{\sin \beta}{\cos \beta}} \right) \left(\frac{\cos \alpha \cos \beta}{\cos \alpha \cos \beta} \right) \\ &= \frac{\cos \alpha \cos \beta + \sin \alpha \sin \beta}{\sin \alpha \cos \beta + \cos \alpha \sin \beta} \\ &= \frac{\cos(\alpha - \beta)}{\sin(\alpha + \beta)} \end{aligned}$$

$$\begin{aligned} 25. \cos(2x) &= \cos(x+x) \\ &= \cos x \cos x - \sin x \sin x \\ &= \cos^2 x - \sin^2 x \end{aligned}$$