

Chapter 4:

- (a). Find the exact value of $\log_{1/5}(125)$.
- (b). Simplify $3^{\log_3(a+b)}$.
- (c). Find the domain of $f(x) = \log_3\left(\frac{3-x}{5+x}\right)$.
- (d). Solve the equation $\log_8(6-m) + \log_8(-m-1) = 1$.
- (e). A \$15,000 investment grows to \$20,000 in 4 years when compounded monthly. Find the interest rate.
- (f). If the half-life of Plutonium-238 is 87.7 years and you currently have 3 kg of it, how much will you have after t years? Write your answer with both base $\frac{1}{2}$ and base e .

6.2 #55,62,95: Prove the following identities.

(a). $\frac{\cos(\alpha-\beta)}{\cos(\alpha+\beta)} = \frac{\cot \alpha \cot \beta + 1}{\cot \alpha \cot \beta - 1}$

(b). $\tan(x+y) + \tan(x-y) = \frac{2 \tan x \sec^2 y}{1 - \tan^2 x \tan^2 y}$

(c). $\sec(x+y) = \frac{\cos(x-y)}{\cos^2 x - \sin^2 y}$.

Chapter 5:

(a). Find the reference angle for $\frac{5\pi}{6}$ and the point on the unit circle determined by it. Also, find distinct positive angles and negative angles coterminal with $\frac{5\pi}{6}$

(b). Find the area of a sector with outer arc length 7 in a circle of radius 5.

(c). If $\tan \theta = \frac{4}{7}$ and $\pi < \theta < \frac{3\pi}{2}$, find the values of the remaining five trigonometric functions of θ .

(d). If $\csc \frac{\pi}{3} = \frac{2\sqrt{3}}{3}$, what are $\sec(\frac{\pi}{6})$ and $\cot \frac{\pi}{3}$?

(e). Find $\cot 330^\circ$

(f). If $\tan \theta = \frac{\sqrt{3}}{3}$ and $0 < \theta < 2\pi$, what might θ be?

6.2 #13,19,24,30,33: Find the exact values of the following.

(a). $\tan \frac{7\pi}{12}$.

(b). $\sin 140^\circ \cos 20^\circ - \cos 140^\circ \sin 20^\circ$.

(c). $\frac{\tan 15^\circ - \tan 45^\circ}{1 + \tan 15^\circ \tan 45^\circ}$

(d). $\cos(\alpha - \beta)$ where $\sin \alpha = \frac{2}{3}$ for α in QII and $\cos \beta = -\frac{1}{4}$ for β in QIII.

(e). $\sin\left(\arcsin \frac{1}{2} - \arccos \frac{\sqrt{2}}{2}\right)$