

Hints

Name: _____ Period: _____ Date: _____

Chapter 5 Practice Problems

$$\sin(A+B) = \sin A \cos B + \cos A \sin B \quad \cos(A+B) = \cos A \cos B - \sin A \sin B \quad \tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

$$\sin(A-B) = \sin A \cos B - \cos A \sin B \quad \cos(A-B) = \cos A \cos B + \sin A \sin B \quad \tan(A-B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

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

$$\cos(2A) = \cos^2 A - \sin^2 A$$

$$\sin\left(\frac{A}{2}\right) = \pm \sqrt{\frac{1 - \cos A}{2}}$$

$$\cos(2A) = 2 \cos^2 A - 1$$

$$\tan(2A) = \frac{2 \tan A}{1 - \tan^2 A}$$

$$\cos(2A) = 1 - 2 \sin^2 A$$

$$\cos\left(\frac{A}{2}\right) = \pm \sqrt{\frac{1 + \cos A}{2}}$$

Prove the identity.

1) $\frac{\cos^4 x - \sin^4 x}{\sin^2 x} = \cot^2 x - 1$

Factor

2) $\csc B - \sin B = \cot B \cos B$

Sines & Cosines
then combine fractions w/ common denominator

3) $\cos\left(\frac{\pi}{2} + x\right) = -\sin x$

Use $\cos(A+B)$ formula

$$4) \frac{2 - 2\cos 2x}{\sin 2x} = \sec x (\csc x) - \cot x + \tan x$$

Use double angle formulas

$$5) \text{ Prove } (\cos x - \sin x)(\cos x + \sin x) = \cos 2x$$

FoIL & Double Angle formula

Evaluate without a calculator.

$$6) \tan(165)$$

Tan(A+B)

$$7) \csc(15)$$

Use $\sin\left(\frac{A}{2}\right)$

& then Flip at end

$$8) \cos\left(\frac{\pi}{15}\right)\cos\left(\frac{\pi}{10}\right) - \sin\left(\frac{\pi}{10}\right)\sin\left(\frac{\pi}{15}\right)$$

cos(A+B)

$$9) \cos^2 195 - \sin^2 195$$

cos(2A)

10) $\sec A = -\frac{4}{5}$ with A in QIV and $\cot B = -\frac{12}{5}$ with B in QII, find:

a. $\cos(A - B)$

b. $\sin(2A)$

c. $\cot(A - B)$

d. $\tan(2B)$

11) Sketch a graph of the equation $y = 1 + 2 \sin 4x \cos 2x - 2 \cos 4x \sin 2x$.

12) Sketch a graph of the equation $y = \cos^2(x/2) - \sin^2(x/2)$

① Draw Pics of
A & B

② Use formula, Flip
at end if reciprocal

Use $\sin(A - B)$ to
condense. Then graph
by finding.
[A], $y = D$, Period
 $(\frac{2\pi}{B})$
& $Bx = C$ for
Starting point.

Use $\cos 2A$ to
condense.

13) Sketch a graph of the equation $y = 10\sin(x/4)\cos(x/4)$

Use $\sin 2A$
to condense.

14) Sketch a graph of the equation $y = 1/(\cos(3x)\sin(2x) - \cos(2x)\sin(3x))$

Use $\sin(A-B)$ to
condense denominator.
* Rewrite $\frac{1}{\sin x}$ as
 $\csc x$ and
graph.

15) Find the exact value of $\cos(\arcsin(4/5) - \tan^{-1}(3))$

Let $A = \arcsin(4/5)$
 $B = \tan^{-1}(3)$
Draw pics of A & B .
Use $\cos(A-B)$
formula.

16) Evaluate the following.

$$2\tan(15)/(1 - \tan^2(15))$$

$\tan 2A$

$$(\tan 140 - \tan 5)/(1 + \tan 5 \tan 140)$$

$\tan(A-B)$

$$\cos(\pi/5)\cos(19\pi/30) - \sin(\pi/5)\sin(19\pi/30)$$

$\cos(A+B)$

$$\sec(75^\circ)$$

Use $\sin(\frac{A}{2})$
then flip.

17) Evaluate the following.

$\cos(105^\circ)$

use $\cos\left(\frac{A}{2}\right)$

$\tan(255^\circ)$

use $\tan(A+B)$

$\sin(195^\circ)$

use $\sin\left(\frac{A}{2}\right)$

$\cot(7\pi/12)$

use $\tan(A+B)$, then
Flip.

$\sec(22.5^\circ)$

use $\cos\left(\frac{A}{2}\right)$, then flip. $\cot(15^\circ)$

use $\tan(A-B)$

$\csc(67.5^\circ)$

use $\sin\left(\frac{A}{2}\right)$, then flip.

$\csc(345^\circ)$

use $\sin(A+B)$
then flip.

18) Find the exact value of $\tan(\arcsin(-5/13) + \arccos(-20/29))$

$$\text{Let } A = \arcsin\left(-\frac{5}{13}\right) \text{ \& } \\ B = \arccos\left(-\frac{20}{29}\right) \\ \text{Use } \tan(A+B).$$

19) . Given $\cos A = -7/25$ in QII and $\csc B = -13/12$ in QIV.
Find $\cos(2A)$

Find $\tan(A+B)$

Draw pics of
A & B

20) Prove the identities.

$$\tan \frac{x}{2} + \cot \frac{x}{2} = 2 \csc x$$

$$\text{Use} \\ \tan \frac{A}{2} = \frac{1 - \cos A}{\sin A}$$

$$\text{or} \\ \tan \frac{A}{2} = \frac{\sin A}{1 + \cos A}$$

therefore

$$\cot \frac{A}{2} = \frac{\sin A}{1 - \cos A} = \frac{1 + \sin A}{\sin A}$$

$$\cos^2 \frac{x}{2} = \frac{\tan x + \sin x}{2 \tan x}$$

$$\text{Use: } \cos \frac{A}{2}$$