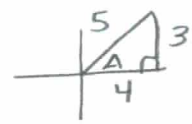
Honors Algebra II/Trig
8.7 Worksheet Day 2

Change to different Δ's

Name: Key



1. Find the exact value given that $\sin A = \frac{3}{5}$ and of A terminates in Quadrant I.

$\sin 2A$

$2\sin A\cos A$

$2\left(\frac{3}{5}\right)\left(\frac{4}{5}\right)$

$\boxed{\frac{24}{25}}$

$\cos 2A$

$2\cos^2 A - 1$

$2\left(\frac{4}{5}\right)^2 - 1$

$\boxed{\frac{7}{25}}$

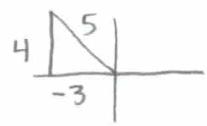
$\frac{2\tan A}{1-\tan^2 A}$

$\frac{2\left(\frac{3}{4}\right)}{1-\left(\frac{3}{4}\right)^2} = \frac{\frac{3}{2}}{1-\frac{9}{16}}$

$\frac{\frac{3}{2}}{\frac{7}{16}} = \frac{3}{\cancel{2}}\cdot\frac{\cancel{16}^{8}}{7} = \boxed{\frac{24}{7}}$

$\tan 2A$

$\frac{\frac{24}{25}}{\frac{7}{25}} = \boxed{\frac{24}{7}}$



2. Find the exact value given that $\cos A = -\frac{3}{5}$ and of A terminates in Quadrant II.

$\sin 2A$

$2\sin A\cos A$

$2\left(\frac{4}{5}\right)\left(\frac{-3}{5}\right)$

$\boxed{\frac{-24}{25}}$

$\cos 2A$

$2\cos^2 A - 1$

$2\left(-\frac{3}{5}\right)^2 - 1$

$\boxed{\frac{-7}{25}}$

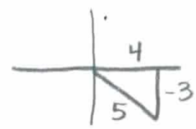
$\frac{2\tan A}{1-\tan^2 A}$

$\frac{2\left(\frac{-4}{3}\right)}{1-\left(\frac{-4}{3}\right)^2} = \frac{\frac{-8}{3}}{1-\frac{16}{9}}$

$\frac{\frac{-8}{3}}{-\frac{7}{9}} = \frac{-8}{\cancel{3}}\cdot\frac{-\cancel{9}^{3}}{7} = \boxed{\frac{24}{7}}$

$\tan 2A$

$\frac{\frac{-24}{25}}{\frac{-7}{25}} = \boxed{\frac{24}{7}}$



3. Find the exact value given that $\tan A = -\frac{3}{4}$ and of A terminates in Quadrant IV.

$\sin 2A$

$2\sin A\cos A$

$2\left(\frac{-3}{5}\right)\left(\frac{4}{5}\right)$

$\boxed{\frac{-24}{25}}$

$\cos 2A$

$\cos^2 A - \sin^2 A$

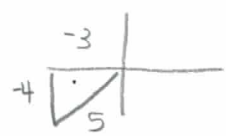
$\left(\frac{4}{5}\right)^2 - \left(\frac{-3}{5}\right)^2$

$\frac{16}{25} - \frac{9}{25}$

$\boxed{\frac{7}{25}}$

$\tan 2A$

$\frac{\frac{-24}{25}}{\frac{7}{25}} = \boxed{\frac{-24}{7}}$



4. Find the exact value given that $\tan A = \frac{4}{3}$ and of A terminates in Quadrant III.

$\sin 2A$

$2\sin A\cos A$

$2\left(\frac{-4}{5}\right)\left(\frac{-3}{5}\right)$

$\boxed{\frac{24}{25}}$

$\cos 2A$

$\cos^2 A - \sin^2 A$

$\left(\frac{-3}{5}\right)^2 - \left(\frac{-4}{5}\right)^2$

$\boxed{\frac{-7}{25}}$

$\tan 2A$

$\frac{\frac{24}{25}}{\frac{-7}{25}} = \boxed{\frac{-24}{7}}$

Prove each of the following identities.

5. $\sec 2x = \dfrac{\sec^2 x}{2-\sec^2 x}$

$$= \frac{\frac{1}{\cos^2 x}}{2-\sec^2 x}$$

$$= \frac{1}{\cos^2 x(2-\sec^2 x)}$$

$$= \frac{1}{2\cos^2 x-1}$$

$$= \frac{1}{\cos 2x}$$

$\sec 2x = \sec 2x$

6. $\sin 2x = 2\cot x \sin^2 x$

$$= 2\frac{\cos x}{\sin x} \cdot \sin^2 x$$

$$= 2\cos x \sin x$$

$\sin 2x = \sin 2x$

7. $\tan 2x(1+\tan x) = \dfrac{2\tan x}{1-\tan x}$

$\dfrac{2\tan x}{1-\tan^2 x} \cdot (1+\tan x) =$

$\dfrac{2\tan x(1+\cancel{\tan x})}{(1+\cancel{\tan x})(1-\tan x)} =$

$\dfrac{2\tan x}{1-\tan x} = \dfrac{2\tan x}{1-\tan x}$

8. $\tan x = \dfrac{\sin 2x}{1+\cos 2x}$

$\tan x = \dfrac{2\sin x\cos x}{1+2\cos^2 x-1}$

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

$$= \frac{\sin x}{\cos x}$$

$\tan x = \tan x$

9. $\cos^2 x = \frac{1}{2}(1+\cos 2x)$

$$= \frac{1}{2}(1+2\cos^2 x-1)$$

$$= \frac{1}{2}(2\cos^2 x)$$

$\cos^2 x = \cos^2 x$