November 16

SWBAT:

Use the double angle formulas to simplify and evaluate trig expressions

Rewrite sin(u + u)

Sum + difference

$\sin(u+v) = \sin(u)\cos(v) + \cos(u)\sin(v)$

$\sin(u+u) = \sin(u)\cos(u) + \cos(u)\sin(u)$

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

Double-Angle Formula

Rewrite $10\sin x\cos x$ using the double angle formula

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

$10\sin x\cos x$

$= 5(2\sin x\cos x)$

$= 5(\sin 2x)$

Double-Angle Formulas:

$\cos 2u = \cos^2 u - \sin^2 u$ $\quad$ $\cos 2u = 1 - \sin^2 u$

$\cos 2u = 2\cos^2 u - 1$

$\tan 2u = \dfrac{2\tan u}{1-\tan^2 u}$

$\sin 2u = 2\sin u \cos u$

Rewrite

$3+6\sin x\cos x$

$3+6\sin x\cos x = 3+3(2\sin x\cos x)$

$= 3+3(\sin 2x)$

$= 3+3\sin 2x$

Double-Angle Formulas:

$\sin 2u = 2\sin u \cos u$

$\cos 2u = \cos^2 u - \sin^2 u$ $\quad$ $\cos 2u = 1 - \sin^2 u$

$\tan 2u = \dfrac{2\tan u}{1-\tan^2 u}$

$\cos 2u = 2\cos^2 u - 1$

Rewrite

$4\cos^2 x - 2$

$4\cos^2 x - 2 = 2(2\cos^2 x - 1)$

$= 2(\cos 2x)$

Double-Angle Formulas:

$$\cos 2u = \cos^2 u - \sin^2 u \qquad \cos 2u = 1 - \sin^2 u$$

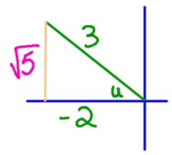
$\cos u = -\frac{2}{3}$

$\frac{\pi}{2} < u < \pi$

find $\sin(2u)$

$\cos(2u)$

$\tan(2u)$



$\cos(u) = \frac{-2}{3} = \frac{adj}{hyp}$

$3^2 = (-2)^2 + a^2$

$\sqrt{5} = a$

$\cos(u) = -\frac{2}{3}$

$\sin(u) = \frac{\sqrt{5}}{3}$

$\tan(u) = \frac{-\sqrt{5}}{2}$

$$\sin 2u = 2\sin u \cos u$$

$\sin 2u = 2\sin u \cos u$

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

$\sin 2u = \frac{-4\sqrt{5}}{9}$

$$\cos 2u = 2\cos^2 u - 1$$

$\cos 2u = 2\left(\frac{-2}{3}\right)^2 - 1$

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

$= \frac{8}{9} - 1 = \frac{-1}{9}$

$$\tan 2u = \frac{2\tan u}{1 - \tan^2 u}$$

$\tan 2u = \frac{2\left(\frac{-\sqrt{5}}{2}\right)}{1 - \left(\frac{-\sqrt{5}}{2}\right)^2} = \frac{-\sqrt{5}}{1 - \frac{5}{4}} = \frac{-\sqrt{5}}{-\frac{1}{4}}$

$= 4\sqrt{5}$