Today's Plan:

Learning Target (standard): I will find the derivative of trigonometric functions. I will use algebraic rules to find the derivative of other functions.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make neccessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuarcy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

Derivative Rules 2:

1) $y' = 2x^2\left(7x^5 - 25x^2 - 6\right)\left(x^5 + 2\right)^{-3}$

2) $y' = -3x^2\left(11x^4 + 8x - 5\right)\left(x^3 - 2\right)^{-6}$

3) $f''(x) = \dfrac{30}{x^7}$

4) $f''(x) = \dfrac{4}{5x^{\frac{6}{5}}}$

5) $y' = \dfrac{-x-2}{3y^2}$

6) $y' = \dfrac{15x^2 + 15x^2y + 4y^3}{-5x^3 - 12xy^2}$

7) $f'(x) = 6x\left(\cos 4x^3 - 6x^3 \sin 4x^3 - 2x \sin 4x^3\right)$

8) $f'(x) = \dfrac{5x\left(2 + 5x^5 \cot x^5 + 4x^3 \cot x^5\right)}{\csc x^5}$

9) $f'(x) = 2x \sec 4x^4\left(3 + 24x^4 \tan 4x^4 - 32x^2 \tan 4x^4\right)$

10) $f'(x) = \dfrac{-2x^2\left(16x^4 \cos 4x^4 + 40x \cos 4x^4 - 3 \sin 4x^4\right)}{\left(2x^3 + 5\right)^2}$

11) $f'(x) = \dfrac{-x^2\left(20x^2 \cot x^3 + 12x^5 \csc^2 x^3 + 3\csc^2 x^3\right)}{\cot^2 x^3}$

12) $f'(x) = \dfrac{-x\left(6x^3 \sec^2 x^2 - 8\sec^2 x^2 - 9x \tan x^2\right)}{\left(3x^3 - 4\right)^2}$

Find the derivative.

$$f(x)=(x+1)^{-2}(x^2+2)^{-3}$$

$$f'(x)=-2(x+1)^{-3}(1)(x^2+2)^{-3}-3(x^2+2)^{-4}(2x)(x+1)^{-2}$$

$$=-2(x+1)^{-3}(x^2+2)^{-3}-6x(x^2+2)^{-4}(x+1)^{-2}$$

$$=-2(x+1)^{-3}(x^2+2)^{-4}\left[(x^2+2)+3x(x+1)\right]$$

$$=-2(x+1)^{-3}(x^2+2)^{-4}(x^2+2+3x^2+3x)$$

$$f'(x)=-2(x+1)^{-3}(x^2+2)^{-4}(4x^2+3x+2)$$

Find the derivative:

$$f(x)=\left(7x+\sqrt{x^2+3}\right)^6=\left(7x+(x^2+3)^{\frac{1}{2}}\right)^6$$

$$f'(x)=6\left(7x+(x^2+3)^{\frac{1}{2}}\right)^5\left[7+\tfrac{1}{2}(x^2+3)^{-\frac{1}{2}}(2x)\right]$$

$$=6\left(7x+\sqrt{x^2+3}\right)^5\left(7+\frac{x}{\sqrt{x^2+3}}\right)$$

$$=6\left(7x+\sqrt{x^2+3}\right)^5\left(\frac{7\sqrt{x^2+3}+x}{\sqrt{x^2+3}}\right)$$

$$f'(x)=\frac{6\left(7x+\sqrt{x^2+3}\right)^5\left(7\sqrt{x^2+3}+x\right)}{\sqrt{x^2+3}}$$

Find the derivative:

$$f(x)=\sqrt[4]{\frac{4x-5}{2x+3}} = \left(\frac{4x-5}{2x+3}\right)^{\frac{1}{4}}$$

$$f'(x)=\frac{1}{4}\left(\frac{4x-5}{2x+3}\right)^{-\frac{3}{4}}\left[\frac{4(2x+3)-2(4x-5)}{(2x+3)^2}\right]$$

$$=\frac{1}{4}\left(\frac{2x+3}{4x-5}\right)^{\frac{3}{4}}\left[\frac{8x+12-8x+10}{(2x+3)^2}\right]$$

$$=\frac{1}{4_2}\left(\frac{22^{11}}{(4x-5)^{\frac{3}{4}}(2x+3)^{\frac{5}{4}}}\right)$$

$$f'(x)=\frac{11}{2\sqrt[4]{(4x-5)^3(2x+3)^5}}$$

Find the y'.

$$y=\sec^2 x\sin xy$$

$$y'=2\sec x(\sec x\tan x)\sin xy+(y+xy')\cos xy\sec^2 x$$

$$y'=2\sec^2 x\tan x\sin xy+y\cos xy\sec^2 x+xy'\cos xy\sec^2 x$$

$$y'-xy'\cos xy\sec^2 x=2\sec^2 x\tan x\sin xy+y\cos xy\sec^2 x$$

$$y'(1-x\cos xy\sec^2 x)=2\sec^2 x\tan x\sin xy+y\cos xy\sec^2 x$$

$$y'=\frac{2\sec^2 x\tan x\sin xy+y\cos xy\sec^2 x}{1-x\cos xy\sec^2 x}$$

Assignment:

Derivative Rules 3

#1-10