151 h
dy/dx

$$\sin\left(\frac{2x}{x+1}\right)$$

Chain Rule.

Outer $f(x) = \sin(x)$

Inner $g(x) = \frac{2x}{x+1}$

$$\frac{d}{dx}\sin\left(\frac{2x}{x+1}\right)$$

$$\cos\left(\frac{2x}{x+1}\right) \cdot \frac{d}{dx}\left(\frac{2x}{x+1}\right)$$

Quotient Rule

$$\cos\left(\frac{2x}{x+1}\right)\left(\frac{(x+1)\cdot 2 - (2x)(1)}{(x+1)^2}\right)$$

$$2x + 2 - 2x$$

$$\cos\left(\frac{2x}{x+1}\right)\frac{2}{(x+1)^2}$$

$$\sin\left(\frac{x}{\ln(3x)}\right)$$

$$\cos\left(\frac{x}{\ln(3x)}\right)\frac{\ln(3x) - x\frac{1}{x}}{\ln(3x)}$$

$$\frac{d}{dx}\ln(Bx) = \frac{1}{Bx}\cdot B$$

$$\ln(Bx) = \ln B + \ln x$$

$$\frac{d}{dx}\ln(Bx) = 0 + \frac{1}{x}$$

$\ln x + C$

$\ln x$

$$3x \cdot e^{3y} - 7x \sin y = 5$$

$$\frac{d}{dx}(3x \cdot e^{3y}) - \frac{d}{dx}(7x \sin y)$$

$$3x \cdot \frac{d}{dx} e^{3y} + e^{3y} \frac{d}{dx} 3x - 7x \frac{d}{dx} \sin y - \sin y \frac{d}{dx} 7$$

$$3x e^{3y} \cdot \frac{d}{dx} 3y + e^{3y} \cdot 3 - 7x \cos y \frac{dy}{dx} - \sin y \cdot 7$$

$$3x e^{3y} \cdot 3 \frac{dy}{dx} + 3e^{3y} - 7x \cos y \frac{dy}{dx} - 7 \sin y = 0$$

$$\frac{dy}{dx}(3x e^{3y} - 7x \cos y) = 7 \sin y - 3e^{3y}$$

$$\frac{dy}{dx} = \frac{7 \sin y - 3e^{3y}}{3x e^{3y} - 7x \cos y}$$

$$\frac{d}{dx}\sin^2(x^9+3) =$$

Power Rule, chain Rule, chain Rule

$$2\left(\sin(x^9+3)\right)^1 \cdot \cos(x^9+3)\cdot \frac{d}{dx}x^9$$

$$2\sin(x^9+3)\cos(x^9+3)\cdot 9x^8$$

$$\frac{d}{dx}\sin^{-1}(x^9+3)$$

$\sin^{-1}$ means inverse sine

$$\frac{d}{dx}\sin^{-1}(u) = \frac{1}{\sqrt{1-u^2}}\frac{du}{dx}$$

$$= \frac{1}{\sqrt{1-(x^9+3)^2}}\cdot 9x^8$$

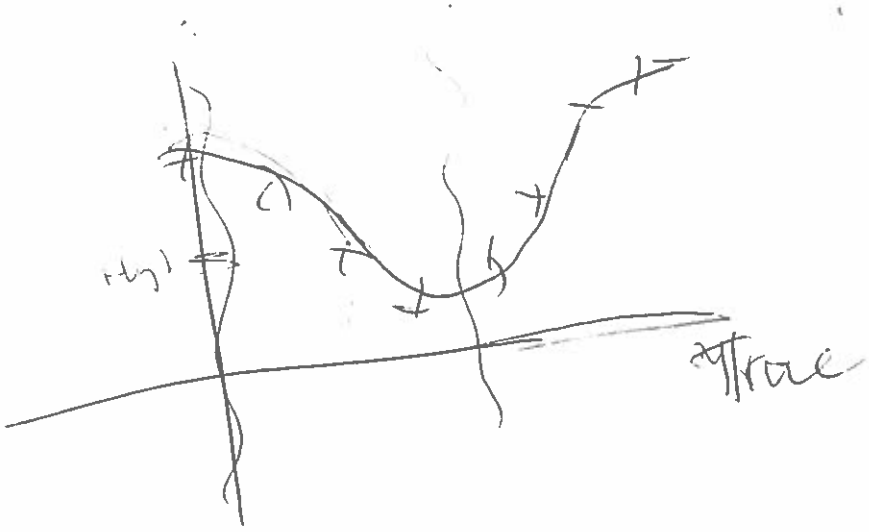
$$\frac{d}{dx}\sec(x^2+8)$$

$$\frac{d}{dx}\sec u = \sec u \tan u \frac{du}{dx}$$

$$= \sec(x^2+8)\tan(x^2+8)\cdot\frac{d}{dx}(x^2+8)$$

$$= \sec(x^2+8)\tan(x^2+8)\cdot 2x$$

$$y = A\sin(Bx+C) + D$$



$$\frac{y-D}{A} = \sin(Bx+C)$$

$$\sin^{-1}\left(\frac{y-D}{A}\right) = Bx+C$$

$$\frac{\sin^{-1}\left(\frac{x-D}{A}\right)-C}{B} \equiv y^{-1}$$

$$Y_1 = (\sin^{-1}((x-d)/a)-c)/B$$

" at $x = 30$ (MJ sell 30 mill albums)

The rate is 1.66 yrs / 1 million records

GROUP NAME: Who Date: 1/9/19	Student Names (First and Last) Kathleen Speaker/Presenter: Charles Writer/Prep: Jenna Garofalo Leader/Collaborator: Mike, Catherine
Independant Variable (x-axis): # [illegible] in food intake Dependant Variable (y-axis): years	

Conclusion (in words): At 123ppm the years change by 4.9 years per/ppm

Supporting Work: [illegible] hing Diff

ppm	years
122	.01
100	3
143	6
200	9
170	12

SinReg

y = a sin(bx+c)+d

a = -51.499...

b = 0.443...

c = -3.666...

d = 141.071...

y_1 (sin^{-1}((x-D)/A) - C) / B

y_2 = nDeriv (y_1, x, x)

y_3 = SinReg

Interpretation

even # works [illegible] including 47

X	Y1	Y2	Y3
123	1.921	[illegible]	14[illegible].51

GROUP NAME: Fluffy Ponies
Date: 3/4/14

Student Names (First and Last)
Speaker/Presenter: Ahmed / June
Writer/Prep: Courtney
Leader/Collaborator: Tyler

Independant Variable (x-axis): Crime rate
Dependant Variable (y-axis): Income

Conclusion (in words):
At 50% chance of committing a crime, your income is increasing by 83K per year.

Supporting Work:

$Y_1 = (\sin^{-1}(x-d)/a) + c)/b$

$Y_2 = nDeriv(Y_1, x, x)$

$a = .3285\ldots$

$b = .0367\ldots$

$c = 2.3812\ldots$

$d = .4623\ldots$

$x = .50$

$Y_1 = -61.67$ $Y_2 = 83.386$

GROUP NAME: Porter's Minions

Date: 3/4/14

Student Names (First and Last)

Speaker/Presenter: Jason / Dallen

Writer/Prep: Jenn

Leader/Collaborator: Daniella / Kero

Independant Variable (x-axis): tuition

Dependant Variable (y-axis): years

Conclusion (in words):

At a tuition of 3630 it is increasing by 15 yrs/$100

Supporting Work:

x	y_2	y_1
3630	.1493	10.553

$y_1 = (\sin^{-1}((x-d)/a)-c)/b$

$y_2 = nDeriv(y_1, x, x)$