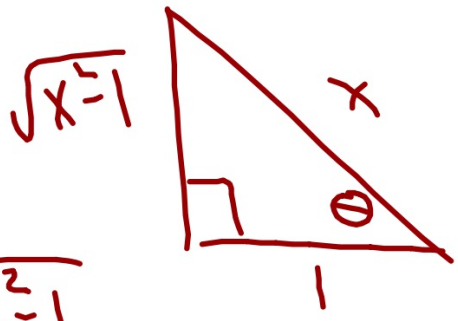
23. $\sin\left(\operatorname{arcsec}\frac{x}{1}\right)$



$x^2 = 1^2 + b^2$

$b = \sqrt{x^2-1}$

$\frac{\sqrt{x^2-1}}{x}$

51. $\arcsin(3x-\pi) = \frac{1}{2}$

$3x-\pi = \sin\left(\frac{1}{2}\right)$

$3x = \dfrac{\sin\left(\frac{1}{2}\right)+\pi}{3}$

5.6B Derivatives

WALT: I can take inverse trig derivatives

A. Definition

1. $\frac{d}{dx}[\arcsin x] = \frac{u'}{\sqrt{1-u^2}}$
2. $\frac{d}{dx}[\arctan x] = \frac{u'}{1+u^2}$
3. $\frac{d}{dx}[\operatorname{arcsec} x] = \frac{u'}{|u|\sqrt{u^2-1}}$

$\frac{d}{dx}[\arccos x] = \frac{-u'}{\sqrt{1-u^2}}$

Rest are negatives!

Ex. $\frac{d}{dx}\left[\arcsin(2x)\right] = \frac{2}{\sqrt{1-(2x)^2}}$

Ex $\frac{d}{dx}\left[\arctan(3x)\right] = \frac{3}{1+(3x)^2}$

Ex. $\frac{d}{dx}\left[\operatorname{arccsc}(e^x)\right] = \frac{-e^x}{|e^x|\sqrt{(e^x)^2-1}}$

Ex. $\frac{d}{dx}\left[\arcsin(x) + x(1-x^2)^{1/2}\right]$

$$\frac{1}{\sqrt{1-x^2}} + (1-x^2)^{1/2} - x^2(1-x^2)^{-1/2}$$

$$= 2(1-x^2)^{1/2}$$

Extrema → set $\frac{dy}{dx} = 0$

and solve

p. 378 41-55 odd

61, 62, 71, 72

$2^{\sin(x)}$

$2^{\cos x}$