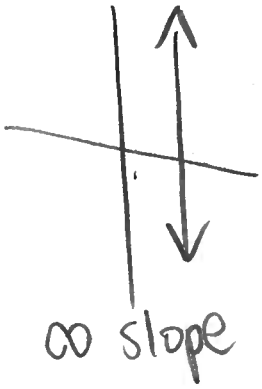
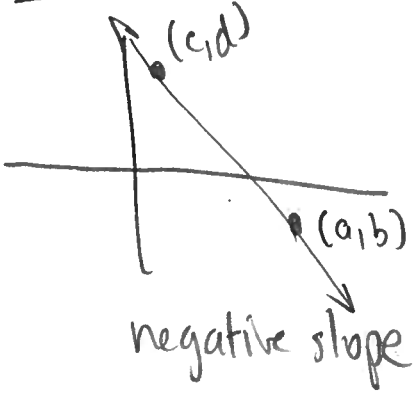
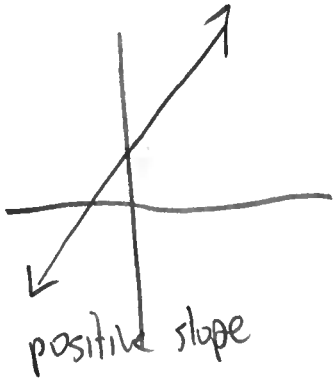
Slope



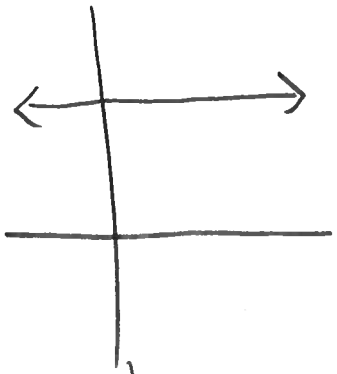
∞ slope



negative slope



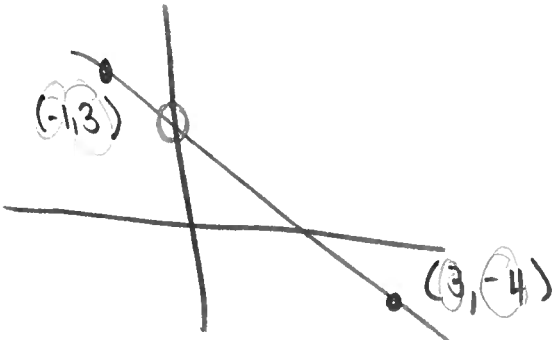
positive slope



zero slope

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{b-d}{a-c}$$

Ex:



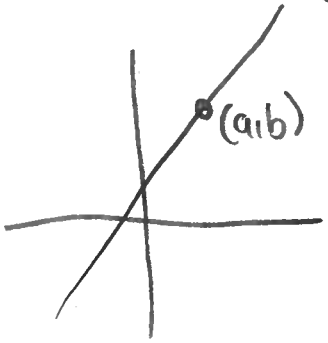
$$\text{slope} = \frac{-4-3}{3-(-1)} = \frac{-7}{4}$$

slope-intercept form

$$y = mx + b$$

Point-slope form eqt of lines

Let (a,b) be on the line, and let m be the slope.



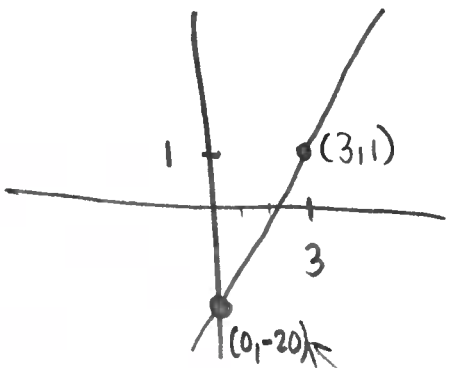
↓

eqt of line is

$$y - b = m(x - a)$$

Ex: Find eqt of line thru $(3,1)$ with slope 7.

a b m

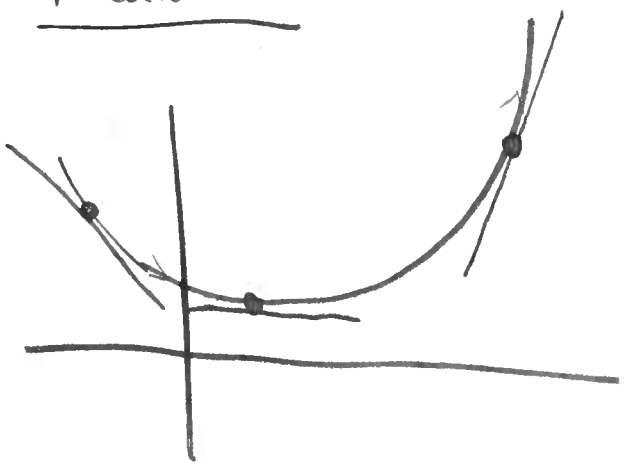


$$\boxed{y-1=7(x-3)}$$

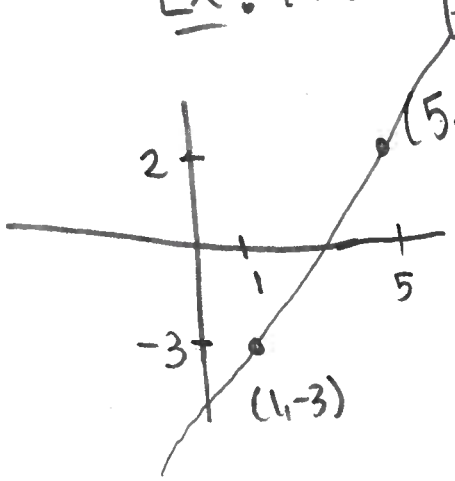
$$y-1=7x-21$$

$$y=7x-20$$

in calculus



Ex: Find eqt of line between $(1,-3)$ and $(5,2)$.



$$\text{slope}=\frac{2-(-3)}{5-1}=\frac{5}{4}$$

Use $(1,-3)$

$$y-(-3)=\frac{5}{4}(x-1)$$

$$y+3=\frac{5}{4}x-\frac{5}{4}$$

$$y=\frac{5}{4}x-\frac{5}{4}-\frac{12}{4}$$

$$y=\frac{5}{4}x-\frac{17}{4}$$

$3=3(1)$

$=3\left(\frac{4}{4}\right)$

$3=\frac{12}{4}$

Use $(5,2)$

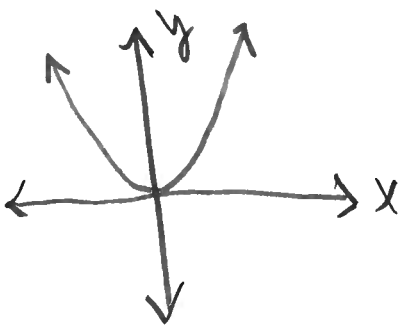
$$y-2=\frac{5}{4}(x-5)$$

$$y-2=\frac{5}{4}x-\frac{25}{4}$$

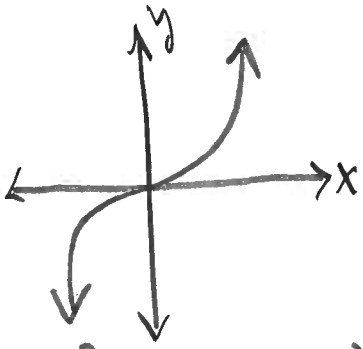
$$y=\frac{5}{4}x-\frac{25}{4}+\frac{8}{4}$$

Common functions in Calculus

$x^2, x^4, x^6, \ldots, x^{\text{teven}}$



$x^3, x^5, x^7, \ldots$

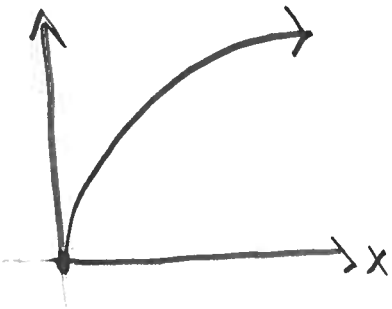


$(-2)^3 = (-2)(-2)(-2)$

$= 4(-2)$

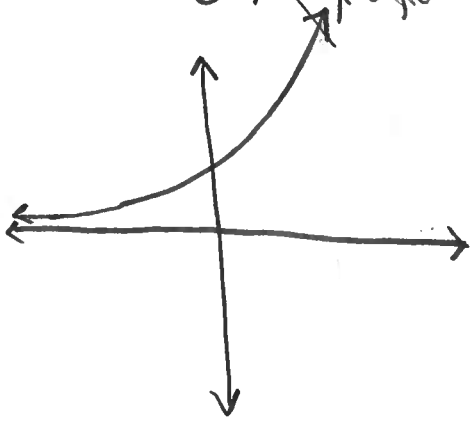
$= -8$

$\sqrt{x}$



$e \approx 2.71\ldots$

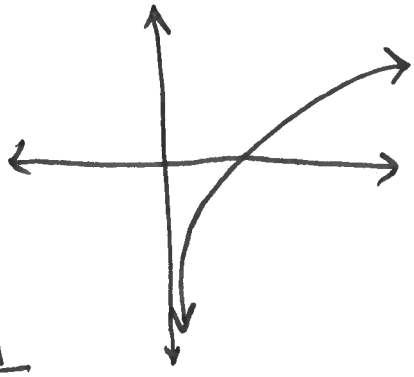
$e^x, 2^x, 5^x$, etc



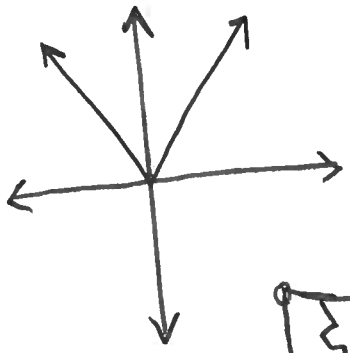
logarithm

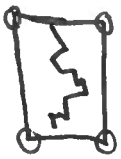
$\ln(x) = \log(x)$

natural log

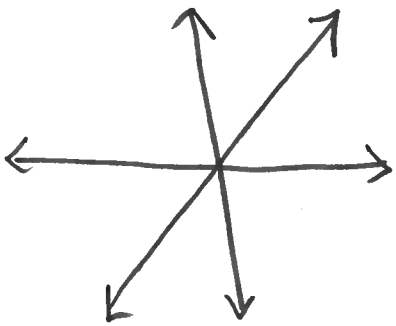


$|x|$

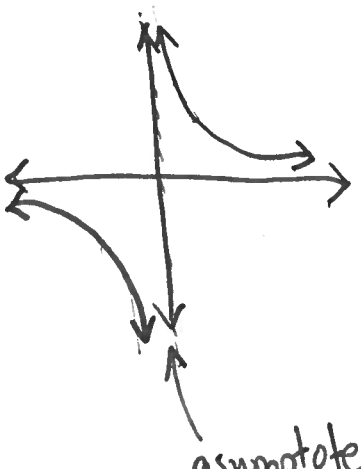




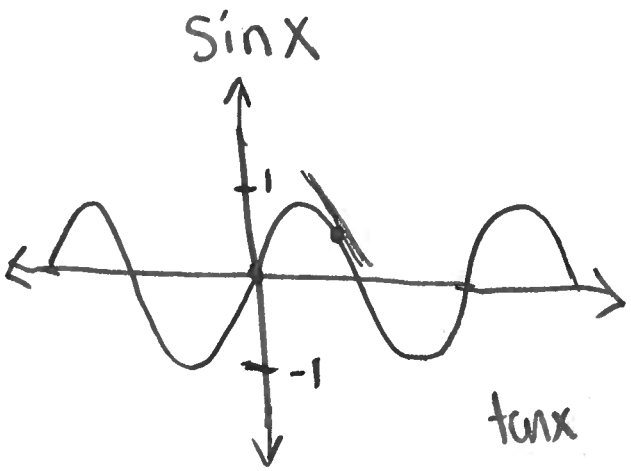
x

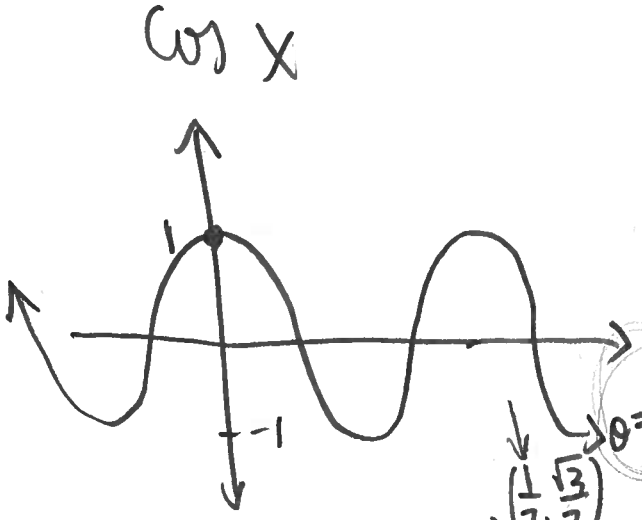


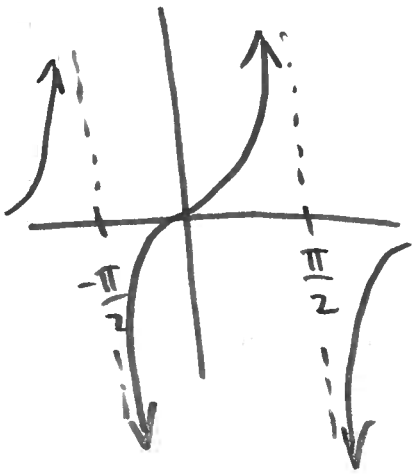
$\frac{1}{x}$

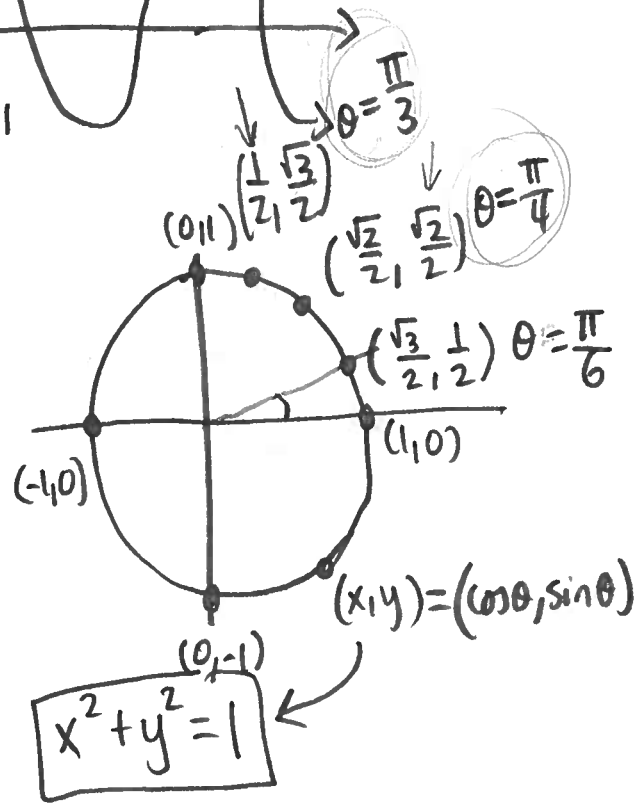


asymptote









$$\cos\left(\frac{\pi}{3}\right)=\frac{1}{2}$$

$$\sin\left(\frac{\pi}{4}\right)=\frac{\sqrt{2}}{2}$$

$$\tan(0)=\frac{\sin(0)}{\cos(0)}=\frac{0}{1}=0$$