

Next quiz: 6.1 + 6.2 2/9/18

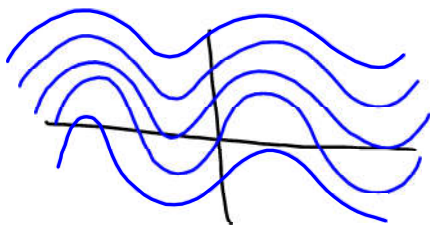
## 6.1 Differential Equations + Slope Fields

Ex) Graph the "family of curves" that solves

$$\frac{dy}{dx} = \cos x$$

$$y = \sin x + C$$

general solution



Ex) Find the particular solution to

$$\frac{dy}{dx} = e^x - 6x^2 \text{ passes through } (1,0).$$

"initial condition"

$$y = e^x - 2x^3 + C$$

$$0 = e^1 - 2(1)^3 + C$$

$$0 = e - 2 + C$$

$$-e + 2 = C$$

$$y = e^x - 2x^3 - e + 2$$

particular solution

Ex)  $\frac{dy}{dx} = 2x - \sec^2 x$  through  $(0,3)$ .

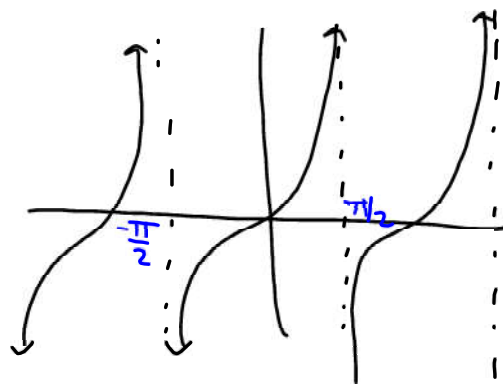
$$y = x^2 - \tan x + C$$

$$3 = 0^2 - \tan 0 + C$$

$$3 = C$$

$$y = x^2 - \tan x + 3$$

$$D: -\pi/2 < x < \pi/2$$

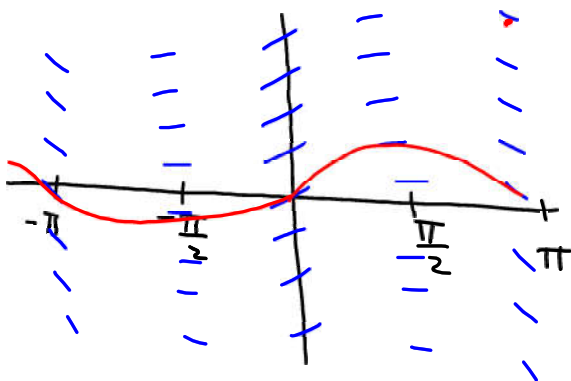


Ex)  $\int f'(x) = \int e^{-x^2}, f(7) = 3$

$$f(x) = \int e^{-x^2}$$

$$f(x) = \int_7^x e^{-t^2} dt + 3$$

Find a slope field for  $\frac{dy}{dx} = \cos x$ .



$$\cos 0 = 1 \quad \cos -\frac{\pi}{2} = 0$$

$$\cos \frac{\pi}{2} = 0 \quad \cos -\pi = -1$$

$$\cos \pi = -1$$

