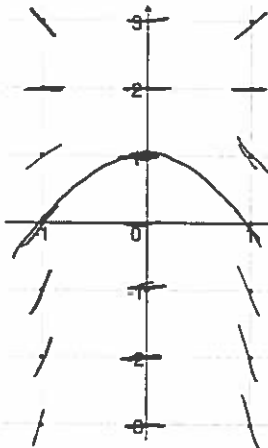


Check out this zero slope field: Key -----

AP Calculus AB: 9.8 Slope Fields

1. Consider the differential equation  $\frac{dy}{dx} = (y - 2)x^2$ ,
- a. draw a slope field for this differential equation and sketch what the graph of  $f(x)$  would look like with the initial condition  $f(0)=1$ .



- b. Find the particular solution of the function with the initial condition  $f(0)=1$ .  
(graph it on a calculator and see if the graph look like the one above)

$u = y - 2$   
 $du = dy$

$$\int \frac{1}{y-2} dy = \int x^2 dx$$

$$\int \frac{1}{u} du = \frac{x^3}{3} + C$$

$$\ln|u| = x^3/3 + C$$

$$\ln|y-2| = x^3/3 + C$$

$$\ln|-2| = 0^3/3 + C$$

$$\ln|-1| = C$$

$$C = \ln(1)$$

$$\ln|y-2| = \frac{x^3}{3} + \ln(1)$$

$$y-2 = e^{\frac{x^3}{3} + \ln(1)}$$

$$y-2 = e^{\frac{x^3}{3}}$$

$$y = e^{\frac{x^3}{3}} + 2$$

2. Consider the differential equation  $\frac{dy}{dx} = (3 - y)\cos(x)$ .
- a. A graph of the slope field is shown below, sketch the solution for the function  $f(x)$  below with the point  $(-1, 0)$ .

