## Math 270 Day 4 Part 1

## Sections 1.3 & 1.4: Direction Fields and Euler's Method (Extra Discussion)

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<u>Definition</u>: For the differential equation y' = f(x, y), an <u>isocline</u> is the set of all points in the xy-plane where y' is a constant. I.e. all points where f(x, y) = c where c is a constant.

Notes:

- An isocline is a curve, but is not a solution to the differential equation (usually)
- Isoclines are helpful in sketching some direction fields by hand

## Sections 1.3 & 1.4: Direction Fields and Euler's Method (Extra Discussion)

Ex 1 (Hw sec. 1.3 #11): For the differential equation below, draw some isoclines with their direction markers and sketch several solution curves including the curve satisfying the given initial condition.

$$\frac{dy}{dx} = -\frac{x}{y} \quad , \quad y(0) = 4$$

## Sections 1.3 & 1.4: Direction Fields and Euler's Method (Extra Discussion)

Ex 2 (Hw sec. 1.3 #15): For the differential equation below, draw some isoclines with their direction markers and sketch several solution curves including the curve satisfying the given initial condition.

$$\frac{dy}{dx} = 2x^2 - y$$
 ,  $y(0) = 0$