

## §9.3 Separable Equation

## In-class Activity 9.3



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## Activity 1:

Find the general solutions of the following separable equations:

(a)  $y \frac{dy}{dx} - x = 0$

(b)  $y' = -ty$

### Activity 2:

Prove that the only solutions to the natural growth/decay equation,  $\frac{df}{dt} = kf$ , are of the form  $f(t) = Ce^{kt}$ .

### Activity 3:

(a) Solve the IVP:

$$y' = \frac{xy^3}{1+x^2}; \quad y(0) = -1$$

(b) Discuss the maximal interval where the solution exists (called an **interval of validity**).