

# MATH 3C SOLVING FIRST-ORDER DIFFERENTIAL EQUATIONS

## I. Undetermined Coefficients

When do you use undetermined coefficients?

How does it work?

Form of final solution:

How do you guess the solution?

**Example.** Solve the differential equation

$$2y' + y = t + 1$$

## II. Integrating Factors

When do you use integrating factors?

How does it work?

**Example.** Solve the differential equation

$$y' + \frac{y}{t} = 4t, \quad t > 0.$$

## III. Practice

(Undetermined coefficients) Find the general solution to the DE

$$y' - 3y = e^{2t}$$

(Integrating factors) Find the general solution to the DE

$$y' + (\sin t)y = e^{\cos t}$$