

**No calculators**

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TA: ☐ Trevor  
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1. In your own words, what does it mean for a differential equation to be linear?

2. Suppose you have a linear ordinary differential equation of order 2 given by

$$a(t)y'' + b(t)y' + d(t)y = 0$$

and you also have two functions  $y_1$  and  $y_2$  that are solutions to the differential equation. Show that  $C_1y_1 + C_2y_2$  is also a solution. ( $C_1$  and  $C_2$  are constants.)