

# Section 31.7/8: cont'd

Tuesday, February 28, 2017 2:06 PM

Mini Quiz 6 will be on Friday

Section 31.7/8:

$$ay'' + by' + cy = 0$$

I will give you:

$$y = C_1 e^{m_1 x} + C_2 e^{m_2 x}$$

$$y = (C_1 + C_2 x) e^{mx}$$

$$y = e^{ax} (C_1 \cos bx + C_2 \sin bx)$$

I will not give the quadratic formula.

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note: there will be a tutorial on Thursday  
in CBA 101

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Test #3 on Friday, March 17

- covers 31.7 - 31.10 and  
Statistics Section 1 & 2

- there will be a formula sheet,  
which I will give out and  
post to the web once it is  
finalized

(note: tentative date for Test 4 is  
Friday, April 7)

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example: solve:

a)  $y'' - 8y' + 16y = 0$

b)  $y'' - 10y' + 16y = 0$

c)  $y'' - 2y' + 5y = 0$

a)  $m^2 - 8m + 16 = 0$   
 $(m-4)(m-4) = 0$

$m = 4$

one repeated real root

$$y = (C_1 + C_2 x)e^{4x}$$

b)  $m^2 - 10m + 16 = 0$   
 $(m-2)(m-8) = 0$

$m = 2, 8$

$$y = C_1 e^{2x} + C_2 e^{8x}$$

$$c) \quad m^2 - 2m + 5 = 0$$

$$m = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{2 \pm \sqrt{4 - 20}}{2}$$

$$= \frac{2 \pm \sqrt{-16}}{2}$$

$$= \frac{2 \pm 4i}{2}$$

$$= 1 \pm 2i$$

$$= a \pm bi$$

$$y = e^{ax} (C_1 \cos bx + C_2 \sin bx)$$

$$= e^x (C_1 \cos 2x + C_2 \sin 2x)$$