Week 9 Wednesday March 6, 2019 7:41 AM Test Overview Checking a solution Quiz 4 31.1 Separable DE Quiz S 31.2 31.4 Linear DE Quiz 6 31.6 Applications 31.7 Z Auxiliary Equation: Distinct Real Roots Repeated / Emplex Roots Quiz 7] 31.8 31.9 Nonhonogeneous DE Quiz Solutions www.leahhoward.Gn We'll review 31.6 and 31.9 Ex: Express as a DE: The rate of change of A with respect to t is proportional to A $\frac{dA}{TL} \propto A$

Answer: dA = KA

Ex: Solve
$$y'' - 6y' + 8y = 2x-3$$

i) Find y_c
 $y'' - 6y' + 8y = 0$
Section 31.7/318
 $m^2 - 6m + 8 = 0$
 $(m-2)(m-4) = 0$
 $m = 2,4$
Distinct Real Roots $y = C_1 e^{m_1 x} + C_2 e^{m_2 x}$
 $y_c = C_1 e^{m_1 x} + C_2 e^{m_2 x}$
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$$Y_{P} = Ax + B$$

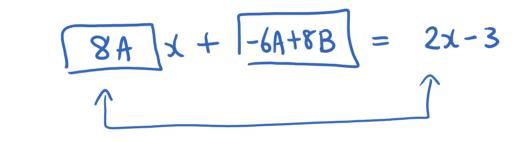
$$Y_{P}' = A$$

$$Y_{P}'' = O$$

$$DE : y'' - 6y' + 8y = 2x - 3$$

$$0 - 6(A) + 8(Ax + B) = 2x - 3$$

$$-6A + 8Ax + 8B = 2x - 3$$



χ:

$$A = 2$$

 $A = \frac{1}{4}$

Constants:
$$-6A+8B = -3$$

 $-\frac{6}{4}+8B = -\frac{12}{4}$
 $8B = -\frac{6}{4}$
 $B = -\frac{6}{4}$
 $B = -\frac{6}{4}$
 $B = -\frac{6}{4}$
 $V_{P} = Ax + B$
 $Y_{P} = \frac{1}{4}x - \frac{3}{16}$

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4)
$$y = y_{c} + y_{p}$$

 $y = C_{1}e^{2x} + C_{2}e^{4x} + \frac{1}{4}s_{1} - \frac{3}{16}$

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