

First Name: _____ **Last Name:** _____

Quiz 2

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- 5 minute individual quiz;
 - Answer the questions in the space provided. If you run out of space, continue onto the back of the page. Additional space is provided at the end;
 - **Show and explain all work;**
 - **Underline** the answer of each steps;
 - The use of books, personal notes, **calculator**, cellphone, laptop, and communication with others is forbidden;
 - By taking this quiz, you agree to follow the university's code of academic integrity.
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Exercise 1 100%

If the Wronskian of $f(x) = e^{2x}$ and $g(x)$ is equal to $3e^{4x}$, find $g(x)$.

Quiz 2: solutions

Exercise 1 100%

From the definition of the Wronskian

$$W(f, g)(x) = f(x)g'(x) - f'(x)g(x)$$

(fine if $f'(x)g(x) - f(x)g'(x)$ is used instead) we get that g satisfies

$$g'(x) - 2g(x) = 3e^{2x}.$$

An integrating factor for this linear first order ODE is

$$\mu(x) = e^{-2x}$$

and so

$$(e^{-2x}g(x))' = 3.$$

Integrating with respect to x we arrive at

$$\boxed{g(x) = 3xe^{2x} + Ce^{2x}}$$

for any constant C .