Which of the following best describes the purpose of 'reduction of order'?

- A. Given one solution of a 2nd-order homogeneous linear differential equation, find another (linearly independent) solution.

- B. Given two solutions of a 2nd-order homogeneous linear differential equation, determine whether they are linearly indepedndent.

- C. Determine whether a linear differential eqution is homogeneous or nonhomogeneous.

Solution:
SOLUTION:
The correct answer is A.
Correct Answers:

- A

2. (1 point)
Consider the differential equation $y'' - y = 0$, and suppose we know that $y_1 = e^x$ is a solution.

(a) For our differential equation, what is the function $P(x)$ with it in the form $y'' + P(x)y' + Q(x)y = 0$? [Choose/0/1/-1]

(b) Plugging in P and y_1 into $y_1 \int \frac{e^{-\int P dx}}{(y_1)^2} dx$ gives (after manipulating the constant) [Choose/A/B/C], where

$$A.\ 0 \qquad B.\ e^x \int \frac{e^{-\int e^x dx}}{e^{x^2}} dx \qquad C.\ e^x \int \frac{c_1}{e^{2x}} dx$$

(c) Solving the integral from part (b) gives (after manipulating the constant) [Choose/A/B/C], where

$$A.\ 0 \qquad B.\ c_1 e^{-x} + c_2 e^x \qquad C.\ e^{-x}$$

(d) We deduce that the second solution can be taken to be [Choose/A/B/C], where

$$A.\ 0 \qquad B. y_2 = xe^x \qquad C.\ y_2 = e^{-x}$$

Solution:
SOLUTION:
The answers are 0, C, B, and C, respectivily.
Correct Answers:

- 0
- C
- B
- C

3. (1 point)
Enter a value for π

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Correct Answers:

- 3.14159