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1. (1 point) If we wanted to verify that  $y = c_1 \sin(x) + c_2 \cos(x) + 2 + x^2$  is a general solution for the differential equation  $y'' + y = 4 + x^2$ , then what must we check? Mark all that are necessary.

- A.  $y_1 = \sin(x)$ ,  $y_2 = \cos(x)$  are continuous functions.
- B.  $y_1 = 2$ ,  $y_2 = x^2$  are linearly independent.
- C.  $y_1 = \sin(x)$ ,  $y_2 = \cos(x)$  are a fundamental set of solutions for  $y'' + y = 0$ .
- D.  $y_p = 2 + x^2$  is a particular solution for  $y'' + y = 4 + x^2$ .
- E.  $y_1 = 2$ ,  $y_2 = x^2$  are continuous functions.
- F. None of the above

**Solution:****SOLUTION:**

The correct answer is CD.

*Correct Answers:*

- CD

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2. (1 point) If we wanted to verify that  $y = c_1 \sin(x) + c_2 \cos(x) + e^x$  is a general solution for the differential equation  $y'' + y = 2e^x$ , then what must we check? Mark all that are necessary.

- A.  $y_1 = 2$ ,  $y_2 = x^2$  are continuous functions.
- B.  $y_p = e^x$  is a particular solution for  $y'' + y = 2e^x$ .
- C.  $y_1 = 2$ ,  $y_2 = x^2$  are linearly independent.
- D.  $y_1 = \sin(x)$ ,  $y_2 = \cos(x)$  are continuous functions.
- E.  $y_1 = \sin(x)$ ,  $y_2 = \cos(x)$  consists of two functions.
- F.  $y_1 = \sin(x)$ ,  $y_2 = \cos(x)$  are linearly independent.
- G.  $y_1 = \sin(x)$ ,  $y_2 = \cos(x)$  are solutions for  $y'' + y = 0$ .
- H. None of the above

**Solution:****SOLUTION:**

The correct answer is BEFG.

*Correct Answers:*

- BEFG

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3. (1 point)

Enter a value for  $\pi$ *Correct Answers:*

- 3.14159