

# PRINTABLE VERSION

## Quiz 5

You scored 60 out of 100

### Question 1

Your answer is **CORRECT**.

Give the general solution of the differential equation

$$y'' + 16y = 3 \tan(4x)$$

- a)   $y = C_1 \sin(4x) + C_2 \cos(4x) - \frac{3}{16} \sin(4x) \ln(\sec(4x) + \tan(4x))$
- b)   $y = C_1 \sin(4x) + C_2 \cos(4x) - \frac{3}{16} \cos(4x) \ln(\sec(4x) + \tan(4x))$
- c)   $y = C_1 \sin(4x) + C_2 \cos(4x) - \frac{3}{16} \sin(4x) \ln(\sec(4x) - \tan(4x))$
- d)   $y = C_1 e^{4x} + C_2 e^{-4x} - \frac{3}{16} \cos(4x) \ln(\sec(4x) + \tan(4x))$
- e)   $y = C_1 e^{4x} + C_2 e^{-4x} - \frac{3}{16} \sin(4x) \ln(\sec(4x) + \tan(4x))$
- f)  None of the above.

### Question 2

Your answer is **INCORRECT**.

Give the general solution of the differential equation

$$y'' + 16y = -5 \sec(4x)$$

- a)   $y = C_1 \sin(4x) + C_2 \cos(4x) - \frac{5}{4} x \cos(4x) - \frac{5}{16} \cos(4x) \ln(|\cos(4x)|)$
- b)   $y = C_1 \sin(4x) + C_2 \cos(4x) - \frac{5}{4} x \sin(4x) - \frac{5}{16} \sin(4x) \ln(|\cos(4x)|)$
- c)   $y = C_1 e^{4x} + C_2 e^{-4x} - \frac{5}{4} x \sin(4x) + \frac{5}{16} \cos(4x) \ln(|\cos(4x)|)$
- d)   $y = C_1 e^{4x} + C_2 e^{-4x} - \frac{5}{4} \sin(4x) - \frac{5}{16} \cos(4x) \ln(|\cos(4x)|)$

- e)   $y = C_1 e^{4x} + C_2 e^{-4x} - \frac{5}{4} \sin(4x) - \frac{5}{16} \sin(4x) \ln(|\cos(4x)|)$
- f)  None of the above.

**Question 3****Your answer is CORRECT.**

Give the general solution of the differential equation

$$y'' - 8y' + 16y = 3e^{4x} + \frac{e^{4x}}{x}$$

- a)   $y = C_1 e^{-4x} + C_2 x e^{-4x} + \frac{3}{2} e^{4x} + e^{4x} \ln(x)$
- b)   $y = C_1 e^{4x} + C_2 x e^{4x} + \frac{3}{2} x^2 e^{4x} + x e^{4x} \ln(x)$
- c)   $y = C_1 e^{4x} + C_2 x e^{4x} + \frac{3}{2} e^{4x} + e^{4x} \ln(x)$
- d)   $y = C_1 e^{4x} + C_2 e^{-4x} + \frac{3}{2} x e^{4x} + e^{4x} \ln(x)$
- e)   $y = C_1 e^{4x} + C_2 x e^{4x} + \frac{3}{2} x e^{4x} - x e^{4x} \ln(x)$
- f)  None of the above.

**Question 4****Your answer is INCORRECT.**

Give the general solution of the differential equation

$$y'' - 8y' + 16y = -5e^{4x} + \frac{e^{4x}}{x^2}$$

- a)   $y = C_1 e^{4x} + C_2 x e^{4x} + \frac{5}{2} x^2 e^{4x} - e^{4x} \ln(x)$
- b)   $y = C_1 e^{-4x} + C_2 x e^{-4x} - \frac{5}{2} x^2 e^{4x} + e^{4x} \ln(x)$
- c)   $y = C_1 e^{4x} + C_2 x e^{4x} - \frac{5}{2} x^2 e^{4x} + e^{4x} \ln(x)$

- d)   $y = C_1 e^{4x} + C_2 e^{-4x} - \frac{5}{2} x e^{4x} - x e^{4x} \ln(x)$
- e)   $y = C_1 e^{4x} + C_2 x e^{4x} - \frac{5}{2} x^2 e^{4x} + x e^{4x} \ln(x)$
- f)  None of the above.

**Question 5****Your answer is CORRECT.**

Give the general solution of the differential equation

$$y'' + 4y = -4 \cos(3x) + 2 \sin(3x)$$

- a)   $y = C_1 \sin(2x) + C_2 \cos(2x) + \frac{4}{5} \cos(3x) - \frac{2}{5} \sin(3x)$
- b)   $y = C_1 \sin(2x) + C_2 \cos(2x) + \frac{4}{5} \cos(3x) + \frac{2}{5} \sin(3x)$
- c)   $y = C_1 e^{2x} + C_2 e^{-2x} + \frac{4}{5} \cos(3x) - \frac{2}{5} \sin(3x)$
- d)   $y = C_1 e^{2x} + C_2 e^{-2x} + \frac{4}{5} \cos(3x) + \frac{2}{5} \sin(3x)$
- e)   $y = C_1 \sin(2x) + C_2 \cos(2x) - \frac{2}{5} \cos(3x) - \frac{3}{5} x \sin(3x)$
- f)  None of the above.

**Question 6****Your answer is INCORRECT.**

Give the general solution of the differential equation

$$y'' + 36y = -5 \cos(6x) + 4 \sin(6x)$$

- a)   $y = C_1 e^{6x} + C_2 e^{-6x} + \frac{5}{12} x \sin(6x) - \frac{1}{3} x \cos(6x)$
- b)   $y = C_1 \sin(6x) + C_2 \cos(6x) - \frac{5}{12} x \sin(6x) + \frac{1}{3} \cos(6x)$
- c)   $y = C_1 e^{6x} + C_2 e^{-6x} + \frac{5}{12} x \sin(6x) + \frac{1}{3} x \cos(6x)$

- d)   $y = C_1 \sin(6x) + C_2 \cos(6x) - \frac{5}{12} x \sin(6x) - \frac{1}{3} \cos(6x)$
- e)   $y = C_1 \sin(6x) + C_2 \cos(6x) - \frac{5}{12} \sin(6x) - \frac{1}{3} \cos(6x)$
- f)  None of the above.

**Question 7**

Your answer is **CORRECT**.

Give the general solution of the differential equation

$$y'' + 7y' + 12y = 2e^{-3x} + 4$$

- a)   $y = C_1 e^{3x} + C_2 e^{4x} + 2e^{-3x} + \frac{1}{3}$
- b)   $y = C_1 e^{3x} + C_2 e^{-4x} + 2xe^{-3x} - \frac{1}{3}$
- c)   $y = C_1 e^{-3x} + C_2 e^{4x} + 2xe^{-3x} - \frac{1}{3}$
- d)   $y = C_1 e^{-3x} + C_2 e^{-4x} - 2xe^{-3x} + 3$
- e)   $y = C_1 e^{-3x} + C_2 e^{-4x} + 2xe^{-3x} + \frac{1}{3}$
- f)  None of the above.

**Question 8**

Your answer is **CORRECT**.

Give the general solution of the differential equation

$$y'' + 8y' + 16y = 5xe^{-4x}$$

- a)   $y = C_1 e^{-4x} + C_2 x e^{-4x} - \frac{5}{3} x^3 + \frac{5}{2} x^2$
- b)   $y = C_1 e^{-4x} + C_2 x e^{-4x} - \frac{5}{6} e^{-4x} x^3$
- c)   $y = C_1 e^{-4x} + C_2 x e^{-4x} + \frac{5}{6} e^{-4x} x^3$

- d)   $y = C_1 e^{-4x} + C_2 x e^{-4x} - \frac{5}{3} x^3 - \frac{5}{2} x^2$
- e)   $y = C_1 e^{-4x} + C_2 x e^{-4x} + \frac{25}{6} e^{-4x} x^3$
- f)  None of the above.

**Question 9**

Your answer is **CORRECT**.

Give the general solution of the differential equation

$$y'' + 10y' + 25y = 3e^{-5x} \cos(5x)$$

- a)   $y = C_1 e^{-5x} + C_2 x e^{-5x} + \frac{6}{5} e^{-5x} x \sin(5x) + \frac{3}{25} e^{-5x} \cos(5x)$
- b)   $y = C_1 e^{-5x} + C_2 x e^{-5x} - \frac{3}{5} x \sin(5x) - \frac{3}{25} \cos(5x) + \frac{3}{5} \sin(5x)$
- c)   $y = C_1 e^{-5x} + C_2 x e^{-5x} - \frac{3}{5} x \sin(5x) - \frac{3}{25} \cos(5x) - \frac{3}{5} \sin(5x)$
- d)   $y = C_1 e^{-5x} + C_2 x e^{-5x} - \frac{3}{25} e^{-5x} \cos(5x)$
- e)   $y = C_1 e^{-5x} + C_2 x e^{-5x} + \frac{3}{25} e^{-5x} \cos(5x)$
- f)  None of the above.

**Question 10**

Your answer is **INCORRECT**.

Give the general solution of the differential equation

$$y'' + 6y' + 8y = 2e^{-4x}$$

- a)   $y = C_1 e^{-4x} + C_2 e^{-2x} + e^{-4x} x - \frac{1}{2} e^{-4x}$
- b)   $y = C_1 e^{-4x} + C_2 e^{-2x} - x - \frac{1}{2} e^{-2x}$
- c)   $y = C_1 e^{-4x} + C_2 e^{-2x} - x + \frac{1}{2} e^{-2x}$

- d)   $y = C_1 e^{-4x} + C_2 e^{-2x} - e^{-4x} x - \frac{1}{2} e^{-4x}$
- e)   $y = C_1 e^{-4x} + C_2 e^{-2x} + e^{-4x} x + \frac{1}{2} e^{-4x}$
- f)  None of the above.

**Question 11**

Your answer is **INCORRECT**.

Give the general solution of the differential equation

$$y'' + 4y' = 5 \sin(4x)$$

- a)   $y = C_1 + C_2 e^{-4x} - \frac{5}{16} \cos(4x) + \frac{5}{32} e^{4x} \cos(4x) - \frac{5}{32} e^{4x} \sin(4x)$
- b)   $y = C_1 + C_2 e^{-4x} + \frac{5}{32} \cos(4x) + \frac{5}{32} \sin(4x)$
- c)   $y = C_1 + C_2 e^{-4x} - \frac{5}{32} \cos(4x) - \frac{5}{32} \sin(4x)$
- d)   $y = C_1 + C_2 e^{-4x} - \frac{5}{16} \cos(4x) - \frac{5}{32} e^{4x} \cos(4x) + \frac{5}{32} e^{4x} \sin(4x)$
- e)   $y = C_1 + C_2 e^{-4x} + \frac{15}{32} \cos(4x) - \frac{5}{32} \sin(4x)$
- f)  None of the above.

**Question 12**

Your answer is **INCORRECT**.

Give the general solution of the differential equation

$$y'' + y' - 6y = 3x + 5$$

- a)   $y = C_1 e^{2x} + C_2 e^{-3x} + \frac{71}{60} + \frac{7}{10} x$
- b)   $y = C_1 e^{2x} + C_2 e^{-3x} + \frac{11}{12} + \frac{1}{2} x$
- c)   $y = C_1 e^{2x} + C_2 e^{-3x} - \frac{11}{12} - \frac{1}{2} x$

- d)   $y = C_1 e^{2x} + C_2 e^{-3x} - \frac{71}{60} - \frac{7}{10}x$
- e)   $y = C_1 e^{2x} + C_2 e^{-3x} + \frac{23}{60} + \frac{1}{10}x$
- f)  None of the above.

**Question 13****Your answer is CORRECT.**

Give the general solution of the differential equation

$$y'' + y' - 2y = x^3 + 2x$$

- a)   $y = C_1 e^x + C_2 e^{-2x} + \frac{19}{8} + \frac{13}{4}x + \frac{3}{4}x^2 + \frac{1}{2}x^3$
- b)   $y = C_1 e^x + C_2 e^{-2x} - \frac{19}{8} - \frac{13}{4}x - \frac{3}{4}x^2 - \frac{1}{2}x^3$
- c)   $y = C_1 e^x + C_2 e^{-2x} + \frac{25}{12} + \frac{23}{6}x + \frac{1}{2}x^2 + \frac{2}{3}x^3$
- d)   $y = C_1 e^x + C_2 e^{-2x} - \frac{25}{12} - \frac{23}{6}x - \frac{1}{2}x^2 - \frac{2}{3}x^3$
- e)   $y = C_1 e^x + C_2 e^{-2x} + \frac{71}{24} + \frac{25}{12}x + \frac{5}{4}x^2 + \frac{1}{6}x^3$
- f)  None of the above.

**Question 14****Your answer is CORRECT.**

Give the general solution of the differential equation

$$y'' - 2y' + 5y = e^{-x} \sin(2x)$$

- a)   $y = \frac{1}{10} \cos(2x) e^{-x} + \frac{1}{20} e^{-x} \sin(2x) + \sin(2x) C_2 + \cos(x) C_1$
- b)   $y = \frac{1}{10} \cos(2x) e^{-x} + \frac{1}{20} e^{-x} \sin(2x) + C_1 e^{2x} \cos(x) + C_2 e^{2x} \sin(x)$
- c)   $y = -\frac{1}{10} \cos(2x) e^{-x} - \frac{1}{20} e^{-x} \sin(2x) + C_1 e^{2x} \cos(x) + C_2 e^{2x} \sin(x)$

- d)   $y = \frac{1}{10} \cos(2x) e^{-x} + \frac{1}{20} e^{-x} \sin(2x) + C_1 e^x \cos(2x) + C_2 e^x \sin(2x)$
- e)   $y = -\frac{1}{10} \cos(2x) e^{-x} - \frac{1}{20} e^{-x} \sin(2x) + C_1 e^x \cos(2x) + C_2 e^x \sin(2x)$
- f)  None of the above.

**Question 15****Your answer is CORRECT.**

Give the general solution of the differential equation

$$y'' + 2y' + 10y = 2e^{3x} \cos(x)$$

- a)   $y = C_1 e^{3x} \cos(x) + C_2 e^{3x} \sin(x) + \frac{3}{40} e^{3x} \cos(x) + \frac{1}{40} \sin(x) e^{3x}$
- b)   $y = C_1 e^{-x} \cos(3x) + C_2 e^{-x} \sin(3x) - \frac{3}{40} e^{3x} \cos(x) - \frac{1}{40} \sin(x) e^{3x}$
- c)   $y = C_1 e^{-x} \cos(3x) + C_2 e^{-x} \sin(3x) + \frac{3}{40} e^{3x} \cos(x) + \frac{1}{40} \sin(x) e^{3x}$
- d)   $y = C_1 e^{3x} \cos(x) + C_2 e^{3x} \sin(x) - \frac{3}{40} e^{3x} \cos(x) - \frac{1}{40} \sin(x) e^{3x}$
- e)   $y = \frac{3}{40} e^{3x} \cos(x) + \frac{1}{40} \sin(x) e^{3x} + C_2 \sin(3x) + \cos(x) C_1$
- f)  None of the above.

**Question 16****Your answer is CORRECT.**

Find the solution of the given initial-value problem.

$$y'' - 3y' + 2y = x$$

$$[y(0) = 1, y'(0) = 2]$$

- a)   $y = -e^{2x} - \frac{5}{4} e^x + \frac{3}{4} + \frac{1}{2} x$
- b)   $y = \frac{5}{4} e^{2x} - e^x - \frac{3}{4} - \frac{1}{2} x$
- c)   $y = \frac{5}{4} e^{2x} - e^x + \frac{3}{4} + \frac{1}{2} x$

- d)   $y = -e^{2x} + \frac{5}{4} e^x$
- e)   $y = \frac{5}{4} e^{2x} + e^x$
- f)  None of the above.

**Question 17****Your answer is CORRECT.**

Find the solution of the given initial-value problem.

$$y'' + 9y = x^2 + 6e^x$$

$$[y(0) = 0, y'(0) = 5]$$

- a)   $y = \frac{22}{15} \cos(3x) - \frac{233}{405} \sin(3x)$
- b)   $y = -\frac{233}{405} \cos(3x) + \frac{22}{15} \sin(3x) - \frac{1}{9} x^2 + \frac{2}{81} - \frac{3}{5} e^x$
- c)   $y = \frac{22}{15} \cos(3x) + \frac{233}{405} \sin(3x) + \frac{1}{9} x^2 - \frac{2}{81} + \frac{3}{5} e^x$
- d)   $y = -\frac{233}{405} \cos(3x) - \frac{22}{15} \sin(3x)$
- e)   $y = -\frac{233}{405} \cos(3x) + \frac{22}{15} \sin(3x) + \frac{1}{9} x^2 - \frac{2}{81} + \frac{3}{5} e^x$
- f)  None of the above.

**Question 18****Your answer is INCORRECT.**

Find the solution of the given initial-value problem.

$$y'' - 2y' - 3y = \sin(3x)$$

$$[y(0) = 0, y'(0) = 1]$$

- a)   $y = \frac{7}{24} e^{-x} - \frac{13}{40} e^{3x}$
- b)   $y = -\frac{13}{40} e^{-x} + \frac{7}{24} e^{3x} - \frac{1}{30} \cos(3x) + \frac{1}{15} \sin(3x)$
- c)   $y = \frac{13}{40} e^{3x} + \frac{7}{24} e^{-x} + \frac{1}{30} \cos(3x) - \frac{1}{15} \sin(3x)$

- d)   $y = -\frac{13}{40} e^{-x} - \frac{7}{24} e^{3x}$
- e)   $y = -\frac{13}{40} e^{-x} + \frac{7}{24} e^{3x} + \frac{1}{30} \cos(3x) - \frac{1}{15} \sin(3x)$
- f)  None of the above.

**Question 19**

Your answer is **INCORRECT**.

Give the form of a particular solution of the differential equation

$$y'' - y' - 20y = 3 \cos(2x) - 2e^{-4x} + 2$$

- a)   $z = A \cos(2x) + B \sin(2x) + C e^{-4x} + E$
- b)   $z = A \cos(2x) + B x e^{-4x} + C$
- c)   $z = A \cos(2x) + B \sin(2x) + C x e^{-4x} + E$
- d)   $z = A \cos(2x) + B e^{-4x} + C$
- e)   $z = A \cos(2x) + B \sin(2x) + C e^{-4x} + E x$
- f)  None of the above.

**Question 20**

Your answer is **CORRECT**.

Give the form of a particular solution of the differential equation

$$y'' + 6y' + 9y = e^{-2x} \sin(4x) - 2e^{-3x} - 3x$$

- a)   $z = A e^{-2x} \sin(4x) + C e^{-3x} + E x$
- b)   $z = A e^{-2x} \sin(4x) + C x^2 e^{-3x} + E x$
- c)   $z = A e^{-2x} \sin(4x) + C e^{-3x} + E x + F$
- d)   $z = A e^{-2x} \cos(4x) + B e^{-2x} \sin(4x) + C x e^{-3x} + E x + F$
- e)   $z = A e^{-2x} \cos(4x) + B e^{-2x} \sin(4x) + C x^2 e^{-3x} + E x + F$
- f)  None of the above.

