Answer on Question #62147 – Math – Differential Equations

Question

Which of the following represent the solution of the differential equation d^2y/dx^2+4y=0

5tan2x+5cos2x
5sin2x+4cos2x
5sin2x−3cos2x
5sin^22x−3cos2x

Solution

The differential equation

$$\frac{d^2y}{dx^2} + 4y = 0 \ (1)$$

has the characteristic equation

$$\lambda^2 + 4 = 0 \,,$$

its roots are

$$\lambda_1 = 2i, \lambda_2 = -2i.$$

Hence the solution of the differential equation (1) is

$$y = C_1 \sin(2x) + C_2 \cos(2x) \,;$$

So, y=5sin2x+4cos2x and y=5sin2x−3cos2x can be solutions of the differential equation (1).

Answer: y=5sin2x+4cos2x; y=5sin2x−3cos2x.