

Answer on Question #69667 – Math – Differential Equations

Question

Find the value of m so that the function $y = e^{mx}$ is a solution of the differential equation $y' + 2y = 0$.

Solution

Since the function $y = e^{mx}$ is a solution of the differential equation $y' + 2y = 0$, then $(e^{mx})' + 2e^{mx} = 0$.

Thus,

$$(e^{mx})' + 2e^{mx} = 0,$$

$$me^{mx} + 2e^{mx} = 0,$$

$$e^{mx}(m + 2) = 0.$$

Since $e^{mx} > 0$ for any real numbers m and x , then $m + 2 = 0$.

Therefore, $m = -2$.

Answer: $m = -2$.