

VARIATIONS ON PRACTICE TEST 2

$$\begin{aligned}y' + xy(y + 2) &= 0 \\ y(0) &= -1\end{aligned}$$

44-1. Let y be a real-valued function defined on the real line satisfying the initial value problem above. Compute $\lim_{x \rightarrow -\infty} [y(x)]$.

54-1. Choose a real number x uniformly at random in the interval $[0, 3]$. Choose a real number y independently of x , and uniformly at random in the interval $[0, 4]$. Find the probability that $y < x^2$.

61-1. A tank initially contains a salt solution of 35 ounces of salt dissolved in 50 gallons of water. Pure water is sprayed into the tank at a rate of 6 gallons per minute. The sprayed water is continually mixed with the salt solution in the tank, and the mixture flows out of the tank at a rate of 2 gallons per minute. If the mixing is instantaneous, how many ounces of salt are in the tank after 12 minutes have elapsed?

65-1. Let g be a differentiable function of two real variables, and let f be the function of a complex variable z defined by

$$f(z) = e^{xy} + i \cdot (g(x, y)),$$

where x and y are the real and imaginary parts of z , respectively. If f is an analytic function on the complex plane, then $(g(4, 2)) - (g(0, 1)) =$
