Math 240 - Quiz 1

January 18, 2022

Name _____

Score _____

This quiz is available in Canvas. It is due January 25.

1. (1 point) Choose the word or phrase that does NOT describe the equation $(1 - x^2)y'' - 2xy' + 12y = 0$.

   (a) Ordinary

   (b) Nonlinear

   (c) 2nd-order

   (d) Dependent variable y

2. (1 point) Choose the word or phrase that does NOT describe the equation $\dfrac{\partial u}{\partial t} = \dfrac{4}{5}\dfrac{\partial^2 u}{\partial y^2}$.

   (a) Partial

   (b) Linear

   (c) 2nd-order

   (d) Dependent variable y

3. (1 point) Choose the word or phrase that does NOT describe the equation $y^3 y' + xy'' = xe^x$.

   (a) Ordinary

   (b) Nonlinear

   (c) 3rd-order

   (d) Independent variable x

4. (1 point) Which one of these is NOT a solution of $e^y y' = 1$?

   (a) $y = \ln x$

   (b) $y = \ln x + 5$

   (c) $y = \ln(x + 5)$

   (d) None of the above

5. (2 points) Solve the initial value problem, and then compute $y(\pi/4)$.

$$\frac{dy}{dx} = \frac{10}{x^2+1}, \quad y(0) = 0$$

(a) $y(\pi/4) = 4.8048$

(b) $y(\pi/4) = 2.4024$

(c) $y(\pi/4) = 10.0000$

(d) None of the above

6. (2 points) Solve the initial value problem, and then compute $y(0)$.

$$\frac{dy}{dx} = 2x\sqrt{3x^2+1}, \quad y(1) = 2$$

(a) $y(0) = 4/9$

(b) $y(0) = 1/3$

(c) $y(0) = 0$

(d) None of the above

7. (2 points) The line tangent to the graph of f at the point (x, y) passes through the origin. Which differential equation has $y = f(x)$ as one of its solutions?

(a) $dy/dx = xy$

(b) $dy/dx = y/x$

(c) $dy/dx = x/y$

(d) None of the above