

IUPUI

Department of Mathematical Sciences

April 28, 2018

Calculus for Life Sciences 2 (MATH 23200)

PRACTICE FINAL EXAM

Last Name:

First Name:

Last Four Digits of Your Student ID:

Please, mark your section:

MW 10:30AM - 11:45AM, Rubchinsky

MW 3:00PM - 4:15PM, Worth

TR 10:30AM - 11:45AM, Cowen

Books, notes, calculators and other paper and electronic (e.g. laptops, cell phones) materials and devices are NOT allowed.

If you will leave the exam room, you will NOT be able to return and continue working on your exam.

SHOW YOUR WORK!

(correct answer, which is not accompanied by correct solution, earns 0 points)

Each problem = 3 points

Problem 1 $A = \begin{pmatrix} 1 & 3 \\ -2 & -1 \end{pmatrix}$. Find A^{-1} (§6.3)

Answer:

Problem 2 Find eigenvalues and eigenvectors for $\begin{pmatrix} 3 & 2 \\ 4 & 1 \end{pmatrix}$ (§6.4)

Answer:

Problem 3 Linearize $f(x, y) = e^x y^2 + x \sin(xy)$ around $(0, 1)$ (§7.2)

Answer:

Problem 4 $f(x, y) = x^3 + y^3 - 6xy$. Use D-test to find locations of relative minima, maxima, and saddle points (if any). (§7.3)

Answer:

Problem 5 Find $\int_0^4 \int_0^{\ln x} e^y dy dx$ (§7.5)

Answer:

Problem 6 $x^2y' + xy = x^4$, $y(2)=5$. Solve the initial value problem (§8.2).

Answer:

Problem 7 $y' = 3x^2(y - 2)^2$. Find general solution. (§8.4)

Answer:

Problem 8 $y' = y^3 + y^2 - 6y$. Find equilibrium points and their stability. (§8.3)

Answer:

Problem 9 $y'' + 4y' + 8y = x$. Find general solution. (§9.1)

Answer:

Problem 10 Find general solution for (§9.3,9.4)

$$x' = 3x + y$$

$$y' = x + 3y$$

Answer:

Problem 11 Characterize the type of equilibrium point $(0, 0)$ for (§9.4)

$$x' = -4x + y$$

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

Answer: