EMCF05 – Math 1432, 13209

The answer sheet for this assignment can be found by logging into *CourseWare* at
http://www.casa.uh.edu, selecting **Math 1432(13209)**, clicking on the **EMCF** tab at the
top of the page, and selecting **EMCF05**.

1. Solve $\dfrac{dy}{dx} = -3y,\ y(0) = 2$.

   a. $3e^{-2x}$
   b. $-3e^{2x}$
   c. $2e^{-3x}$
   d. $-2e^{3x}$
   e. None of these.

2. Solve $\dfrac{dy}{dx} = 2y,\ y(0) = -3$.

   a. $3e^{-2x}$
   b. $-3e^{2x}$
   c. $2e^{-3x}$
   d. $-2e^{3x}$
   e. None of these.

3. Solve $u'(t) = 4u(t),\ u(0) = 1$.

   a. e^{4t}
   b. $4e^{t}$
   c. $4e^{-t}$
   d. $-4e^{t}$
   e. None of these.

4. $\displaystyle \int \tan(2x)\,dx =$

   a. $\ln\left|\sqrt{\sec(2x)}\right| + C$

   b. $\dfrac{1}{2}\ln\left|\cos(2x)\right| + C$

   c. $\dfrac{1}{2}\ln\left|\sin(2x)\right| + C$

   d. $\ln\left|\sqrt{\csc(2x)}\right| + C$

   e. None of these.

5. $\int \cot(2x)\,dx =$

    a. $\ln\left|\sqrt{\sec(2x)}\right| + C$

    b. $\dfrac{1}{2}\ln\left|\cos(2x)\right| + C$

    c. $\dfrac{1}{2}\ln\left|\sin(2x)\right| + C$

    d. $\ln\left|\sqrt{\csc(2x)}\right| + C$

    e. None of these.

6. Give the slope of the tangent line to the graph of $f(x) = (\sin(x) + 1)^{\cos(x)}$ at $x = 0$.

    a. 2
    b. 1
    c. 1/2
    d. 3/4
    e. None of these.

7. Give the value of k so that $\dfrac{dy}{dx} = ky$, $y(0) = 2$, $y(1) = 3$.

    a. $\ln(3)$

    b. $2\ln(3)$

    c. $\ln(3/2)$

    d. $\dfrac{1}{2}\ln(3)$

    e. None of these.

8. Give the value of k so that $\dfrac{dy}{dx} = ky$, $y(0) = 1$, $y(2) = 3$.

    a. $\ln(3)$

    b. $2\ln(3)$

    c. $\ln(3/2)$

    d. $\dfrac{1}{2}\ln(3)$

    e. None of these.

9. The function $f(x) = x + x^3 + 1$ is invertible. Give $\left(f^{-1}\right)'(3)$.

    a. 1/4

    b. 1/3

    c. 1/2

    d. 1

    e. None of these.

10. The function $f(x) = x + x^3 + 1$ is invertible. Give the y-intercept for the tangent line to the graph of $f^{-1}(x)$ at $x = 3$.

    a. 1/4

    b. 1/3

    c. 1/2

    d. 1

    e. None of these.