EMCF24 – 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 **EMCF24**.

1. Give the LUB of the sequence $\left\{1+\frac{(-1)^n n}{n+2}\right\}_{n=1}^{\infty}$.
   a. 3
   b. 2
   c. 1
   d. 0
   e. DNE
   f. None of these.
2. Give the GLB of the sequence $\left\{1+\frac{(-1)^n n}{n+2}\right\}_{n=1}^{\infty}$.
   a. 3
   b. 2
   c. 1
   d. 0
   e. DNE
   f. None of these.
3. The sequence $\left\{1+\frac{(-1)^n n}{n+2}\right\}_{n=1}^{\infty}$ is
   a. Increasing
   b. Decreasing
   c. Bounded, but neither increasing nor decreasing
   d. None of these.
4. Give the LUB of the sequence $\left\{\frac{n^2+n+1}{2n^2+3n+2}\right\}_{n=1}^{\infty}$.
   a. 0
   b. 1/3
   c. 1/2
   d. 1
   e. DNE
   f. None of these.

5. Give the GLB of the sequence $\left\{\frac{n^2+n+1}{2n^2+3n+2}\right\}_{n=1}^{\infty}$.

   a. 0
   b. 1/3
   c. 1/2
   d. 1
   e. DNE
   f. None of these.

6. Describe the behavior of the sequence $\left\{\frac{n^2+n+1}{2n^2+3n+2}\right\}_{n=1}^{\infty}$

   a. Increasing
   b. Decreasing
   c. Bounded, but neither increasing nor decreasing
   d. None of these.

7. Give the limit of the sequence $\left\{\left(1-\frac{3}{n}\right)^n\right\}_{n=1}^{\infty}$.

   a. e^3
   b. DNE
   c. 1
   d. $1/e^3$
   e. None of these.

8. Give the limit of the sequence $\left\{\ln\left(4n+2\right)-2\ln\left(\sqrt{n}+3\right)\right\}_{n=1}^{\infty}$.

   a. DNE
   b. 1
   c. $\ln\left(4\right)$
   d. $\ln\left(1/4\right)$
   e. None of these.

9. Give the limit of the sequence $\left\{\left(1+\frac{2}{n}\right)^{-n}\right\}_{n=1}^{\infty}$.

   a. 2
   b. e^2
   c. $1/e^2$
   d. DNE
   e. None of these.

10. Give the y intercept of the tangent line to $\left(t^2+t-1, t+t^2\right)$ at the point (1,2).
    a. 0
    b. 1/3
    c. 1/2
    d. 1
    e. 3/2
    f. None of these.
11. Give the area of the portion of polar graph $r=1+\sin(\theta)$ that lies below the x axis.
    a. $\frac{3}{4}\pi-2$
    b. $\frac{3}{4}\pi+2$
    c. $\frac{3}{4}\pi-\frac{\sqrt{2}}{2}$
    d. $\frac{3}{4}\pi+\frac{\sqrt{2}}{2}$
    e. None of these.
12. Write the curve given parametrically by $\left(\cos(t), 2\sin(t)\right)$ as an equation in x and y.
    a. $2x^2-y^2=1$
    b. $2x^2+y^2=1$
    c. $x^2+\frac{y^2}{4}=1$
    d. $\frac{x^2}{4}+y^2=1$
    e. None of these.
13. Write the curve given parametrically by $\left(e^t, 2e^{-t}\right)$ as an equation in x and y.
    a. $y=2/x,\ x<0$
    b. $y=2/x,\ x\geq 0$
    c. $y=2/x,\ x>0$
    d. None of these.
14. Which of the following is true about the sequence $\left\{\ln\left(\frac{n+3}{n+1}\right)\right\}_{n=1}^{\infty}$.
    a. Increasing
    b. Decreasing
    c. Bounded, but neither increasing nor decreasing
    d. None of these.

15. Which of the following is true about the sequence $\left\{\frac{2n+1}{3n-2}\right\}_{n=1}^{\infty}$.

a. Increasing
b. Decreasing
c. Bounded, but neither increasing nor decreasing
d. None of these.

16. Which of the following is true about the sequence $\left\{\frac{5n+3}{4-3n}\right\}_{n=1}^{\infty}$.

a. Increasing
b. Decreasing
c. Bounded, but neither increasing nor decreasing
d. None of these.

17. Give the value below that is closest to the length of the curve $\left(\cos(t), \sin(2t)\right)$.

a. 9.39
b. 9.41
c. 9.43
d. 9.45
e. 9.47
f. None of these.

18. Give the value below that is closest to the length of the curve $y = 2x^{3/2}$ for $1 \le x \le 2$.

a. 3.77
b. 3.78
c. 3.79
d. 3.80
e. 3.81
f. None of these.

19. The partial fraction decomposition of $\frac{3x-1}{\left(x^2+1\right)\left(x-1\right)}$ has the form $\frac{Ax+B}{x^2+1}+\frac{C}{x-1}$.

Give the value of $A+B+C$.

a. 1
b. -1
c. 2
d. -2
e. None of these.

20. The substitution $x = 2\sin(\theta)$ is used to compute the integral $\int f(x)\,dx$, and the result is $\sin(2\theta) + \cos(\theta) + C$. Give the answer in terms of x.

a. $(x-1)\sqrt{1-\frac{x^2}{4}} + C$

b. $(2x+1)\sqrt{1-\frac{x^2}{4}} + C$

c. $x\sqrt{1-\frac{x^2}{4}} + x + C$

d. $(x+1)\sqrt{1-\frac{x^2}{4}} + C$

e. None of these.