BSCMA1001: Activity Questions
Week-8

Contents

1 Lecture-1

1. For which point on the Cartesian plane, will the equations $x = \log_2 y = \log_{0.2} y$ be valid?
   - ◯ (1,1)
   - √ (0,1)
   - ◯ (2,1)
   - ◯ (0,2)

2. The domain of $f(x) = \log_2(2 - x)$ is
   - ◯ (-∞,1)
   - √ (-∞,2)
   - ◯ (-∞,1]
   - ◯ (-∞,2]

3. Consider the function $f(x)=\log_{10}\big(\ (\log_{10}x)^2 - 8\log_{10}x + 15\big)$. What is the domain of f?
   - ◯ $(0, 10^{-5}) \cup (10^{-3}, \infty)$
   - ◯ $(0, 10^{-5}] \cup [10^{-3}, \infty)$
   - √ $(0, 10^{3}) \cup (10^{5}, \infty)$
   - ◯ $(0, 10^{3}] \cup [10^{5}, \infty)$

4. The set of all x for which there are no functions of the form $f(x) = \log_{\frac{x-1}{x+1}}(\frac{x^2+1}{x^2-1})$ is
   - ◯ $(-\infty, 0) \cup (0, \infty)$
   - √ $[-1, 1]$
   - ◯ $(-1, 1)$
   - ◯ $(-\infty, -1] \cup [1, \infty)$

5. What is the domain of the function $f(x) = \log(-(xe^{3x} - 27x))$?
   - ◯ (0, ln27)
   - ◯ (0, ln2)
   - √ (0, ln3)
   - ◯ (0, ln3−ln2)

2 Lecture-2

6. The only difference between the graphs of $f(x) = \log_2 x$ and $g(x) = \log_2 (x-1)$ will be-
   - ◯ The ordinate values of $g(x)$ will be 1 more than the ordinate values of $f(x)$.
   - √ The abcissa values of $g(x)$ will be 1 more than the abcissa values of $f(x)$.
   - ◯ Both abcissa and ordinate values of $g(x)$ will be 1 more than the abcissa and ordinate values of $f(x)$ respectively.
   - ◯ There will be no difference.

7. Which of the following statements is/are true for the function $f(x) = \ln |x|$?
   - ◯ f is an increasing function.
   - √ The straight line $x = 0$ is an asymptote of f.
   - ◯ The inverse of f is $e^{|x|}$.
   - √ The domain of f is $(-\infty, 0) \cup (0, \infty,)$.

8. Consider the function $f(x) = \log_2(\log_2(\log_2(x)))$. Which of the following is(are) true about f ?
   - √ f is one-one.
   - ◯ The domain of f is $(0, \infty)$.
   - √ f has an inverse.
   - ◯ The straight line $x = 8$ is an asymptote of f.

3 Lecture-3

9. If the domain of $f(x)$ is $(-3, 1)$, then the domain of $f(\ln x)$ is
   - ◯ (e^{-1}, e^3)
   - ◯ $(0, \infty)$
   - ◯ $(1, \infty)$
   - √ (e^{-3}, e^1)

10. Consider the function $f(x) = \ln(e^x - e^{-x})$. Find the correct options.
    - √ f is an one-one function.
    - ◯ The domain of f is $\mathbb{R}$.
    - √ f is an increasing function.
    - ◯ none of the above.

11. Solve for x in $3^{(x+2)} = 243$.

◯ 4

√ 3

◯ 2

◯ 1

12. Solve for x in $e^{(4^x-2^x-12)} = 1$.

◯ -1

√ 2

◯ 1

◯ -2

4 Lecture-4

13. For $0<a<1$ and $M > 0$, $\log_a(M^2) =$?

◯ 1

√ $2\log_a M$

◯ $2\log_M a$

◯ $\log_a 3M$

14. Solve for $x : \log_{12}(x-2) + \log_{12}(x+2) = 1$

◯ $x = -4$

√ $x = 4$

◯ $x = 2$

◯ $x = -2$

15. The number of solutions of $\ln(\frac{x^2}{4}) - \ln(x-1) = \log_5 5$ is

◯ 0

◯ 1

√ 2

◯ 3

5 Lecture-5

16. How many digits are there in 15^{7^2}?

◯ 49

◯ 50

◯ 57

√ 58

17. Suppose a certain amount of money M is invested in a mutual fund at an annual rate of interest of 5%. How long(approximately) does it take to triple the initial investment, assuming interest is compounded thrice a year?

◯ 11 years

◯ 14 years

◯ 19 years

√ 22 years

6 Lecture-6

18. If $\ln(x^5) = (\ln x)^2$, then the value of $\ln x$ is

◯ 2

√ 5

◯ -5

◯ -2

19. The number of solution of $\log_8(x^3 - 1) = \log_2(x - 1)$ is

√ 0

◯ 1

◯ 3

◯ ∞

7 Lecture-7

20. If the value of $(\frac{1}{\log_3 \pi} + \frac{1}{\log_4 \pi})$ is m, then which of the following options are true for m.

◯ $m \geq 3.178$

√ $2<m<2.2$

◯ $m \leq 2$

◯ $m< \log_2 2$

21. Consider the function $f(x) = \log_{10}(x - [x])$ (where $[x]$ is the greatest integer less or equal to x), and $D \subset \mathbb{R}$ is the set of points at which f is defined. Which of the following options are correct?

√ The set D is infinite.

√ The cardinality of the set $\mathbb{R} \setminus D$ is infinite.

√ The graph of $f(x)$ have an infinite number of vertical asymptotes.

◯ f is an invertible function on D.

◯ Range of the function f is $\mathbb{R}$.

22. Suppose x and y are positive real number. If $\log_x(2) + \log_y(8) = 0$, then which of the following options are true for x and y.

√ $x = 2, y = \frac{1}{8}$

◯ $xy^3 = 1$

◯ $x = 27, y = \frac{1}{3}$

√ $x^3y = 1$