BY KEDRE SEMAN

Writer:

- Kedre seman

CONTANT

Grade 10

1. What is the equivalent radian measure of an angle whose degree measure is 324^0?

   $A.\frac{9}{5}\pi$ B. $\frac{7}{5}\pi$ C. $\frac{5}{9}\pi$ D. $\frac{5}{7}\pi$

2. Suppose that P(3,-1) is on the terminal side of an angle θ in the standard position, what is cot θ?

   A.-3 B. $-\frac{\sqrt{10}}{3}$ C. -1/3 D. $\frac{\sqrt{10}}{3}$

3. Which one of the following is a positive value?

   A. $Cos250^0$ B. $Cos170^0$ C. $Cos(280^0)$ D. $Cos(260^0)$

4. Let $\theta = -420^0$, which one of the following is TRUE about θ?

   A. Cos $\theta = -\frac{1}{2}$ B. Sin $\theta = -\frac{1}{2}$ C. Cos $\theta = \frac{1}{2}$ D. Sin $\theta = \frac{1}{2}$

5. Let θbe an acute angle, then which one of the following is TRUE?

   A. sin $\theta = sin\ (90^0 - \theta)$ C. tanθ = cot$(180^0 - \theta)$

   B. sec θ= csc $(90^0 - \theta)$ D. csc θ = -csc $(180^0 - \theta)$

6. If x is an acute angle and tan x= 3, then what is the value of Cos x?

   A. 3/5 B. $\sqrt{10}$ C. $\frac{1}{\sqrt{5}}$ D. $\frac{\sqrt{10}}{10}$

7. If p(x, y) is a point on the terminal side of an angle θ in standard position where the distance between p and the origin is r, then csc θ is——?

   A. r/y B. r/x C. x/r D. x/y

8. Which of the following is TRUE about the second quadrant angle θ in standard position whose terminal side lies on the line 2x+y=0?

   A. sin θ=$\frac{1}{\sqrt{5}}$ B. cos $\theta = \frac{2}{\sqrt{5}}$ C. sin θ=$\frac{2}{\sqrt{5}}$ D. cos θ= $-\frac{2}{\sqrt{5}}$

9. Which of the following is equal to csc $(\frac{11}{3}\pi)$

A. $-\frac{2\sqrt{3}}{3}$ B. -2 C. $\frac{2\sqrt{3}}{3}$ D.2

10. If $\sin 18^0 = 0.31$ *and* $\cos 18^0 = 0.95$, then which of the following is correct?

A. $\sec 162^0 = -\frac{10}{95}$ B. $\cot 162^0 = -\frac{95}{31}$ C. $\tan 162^0 = \frac{31}{95}$ D. $\csc 162^0 = \frac{10}{31}$

11. *Suppose* $\cos\theta = 0.8$ *and* $\csc\theta < 0$, *then* $\tan\theta$ *is equal to*?

A. 3/5 B. 4/5 C. -3/4 D. -4/3

12. If $\sin\alpha = r$ *and* $\alpha + \theta = 90^0$, then which of the following is true?

A. $\sec\theta = \frac{1}{r}$ B. $\sin\theta = r$ C. $\cos\theta = r$ *D.* $\cos\alpha = \frac{1}{r}$

13. Which of the following is co-terminal with $\theta = 120^0$?

A. -480^0 B. 850^0 C. $-\frac{19\pi}{6}$ *D.* $\frac{14\pi}{3}$

14. The slant height of a square pyramid is the distance measured from its vertex to—?

A. The center of its base C. one of the side of its base

B. any point inside its base D. one of the vertex of its base.

15. A frustum of a square pyramid has height 6cm, where its upper base has side 2cm and lower base of sides is 6cm then what is the volume of the frustum?

A. $104cm^3$ B. $312cm^3$ C. $260cm^3$ D. $208cm^3$

16. A glass is in shape of a frustum of a right circular cone has slant height 10cm and radii 9cm and 3cm. what is the volume of the glass in cm^3?

A. 240π B. 312π C. 192π D. 204π

17. If the radius of a sphere is doubled, what happens to the surface area?

A. it becomes four times as large as the original surface area.

B. it becomes eight times as large as the original surface area

C. it also doubled

D. it is increase by four square units.

18. If a metallic right circular cylinder of height 18cm and the base of the radius is 4cm is malted down to form a sphere, then which one of the following is correct?
    A. The diameter of the sphere is $12\sqrt[3]{4\pi}$ cm
    B. The surface area of the sphere is $144\pi cm^2$
    C. The volume of the sphere is $48\pi cm^3$
    D. The radius of the sphere is $\frac{3}{\sqrt[3]{2}}\pi cm$
19. The diameter of the base and a height of a circular cone are found to be a and 2b units long respectively. What is the formula for the volume v of the cone?

A. $V=\frac{2}{3}\pi a^2 b$ B. $V=\frac{1}{3}\pi a^2 b$ C. $V=\frac{1}{6}\pi a^2 b$ D. $V=\frac{4}{3}\pi a^2 b$

20. The volume of a pyramid that has a height of 8cm and rectangular base of dimensions 6cm by 4cm is

A. $96cm^3$ B. $64cm^3$ C. $576cm^3$ D. $192cm^3$

21. If the frustum is formed from a regular pyramid, then which one of the following statement is TRUE about its lateral faces?
    A. They are isosceles trapezium
    B. Their altitude are NOT equal
    C. They are rhombus
    D. There area are not equal

Grade 11

22. The inverse of a relation A=$\{(x,y): y < x-1 \ and \ y \leq -x\}$ is?
A. $\{(x,y): y < x-1 \ and \ y \geq -x\}$ C. $\{(x,y): y > x+1 \ and \ x \leq -y\}$
B. $\{(x,y): y > x-1 \ and \ y \geq -x\}$ D. $\{(x,y): y > x-1 \ and \ y \leq -x\}$

23. The domain of f(x) = $\frac{1}{\sqrt{4-x^2}}$ $is \ equal \ to$——?
A.$(-\infty,-2)$ B. $(2,\infty)$ $C.(-2,2)$ $D.[-2,2]$

24. $Let \ (x) = sg[\log(4x+10], then \ which \ one$ is $TRUE$?
$A.(-2) = 0$ $B.g\left(-\frac{9}{4}\right) = 1$ $C.g\left(-\frac{99}{10}\right) = -1$ $D.(1) = 0$

25. Which of the following is neither even nor odd function?
$A.f(x) = \frac{|x|}{x}$ $B.(x) = x^2 - |x|$ $C.h(x) = x^5 + 4x^3$ $D.(x) = x + 7$

26. The solution set of the equation $|x+5| = 2x+4$ is?
A.{ } $B.\{-3,1\}$ $C.\{-3\}$ $D.\{1\}$

27. If f(x) = $\sqrt{x}$ and g(x) = $\sqrt{3-x}$, the domain of f + g is
A. $[0.\infty)$ $B.[0,3]$ $C.(-\infty,3]$ $D.(-\infty,3](3.\infty)$

28. Let f(x)=7 and g(x)=$x^2 - 9$, $then \ (fog)(0) is \ equal \ to$?
A.7 B. 40 C. -2 D.7

29. Which of the following is rational function?
$A.f(x) = \frac{\sqrt{x+1}}{\frac{x-1}{}}$ $B.f(x) = x^3 - 3x^2 + log_2 3$ $C.(x) = \frac{x^2+sinx+2}{x+3}$ $D.(x) = \frac{3-4x}{2x-3^x}$

30. If f(x) = $\frac{\sqrt{x+1}}{x-1}$ and f(a) = 5 then is the value/s of a:
A.1 $or \frac{24}{25}$ B. $-1 \ or \frac{24}{25}$ C. $1 \ or \frac{25}{24}$ D. 1 $or -\frac{24}{25}$

31. What is the domain of the rational function f(x) = $\frac{x+2}{x^2+4}x^{-2}$?
A. $IR\backslash\{-2,2\}$ B. $IR\backslash\{-2,0\}$ C. $IR\backslash\{0\}$ D. IR

32. Let f(x) = $\frac{2x+3}{x-1}$, then what is the range of f?
A. $IR\backslash\{1\}$ B. $IR\backslash\{3\}$ $C.IR$ D. $IR\backslash\{2\}$

33. What are the value of a and b which makes the mathematical statement
$\frac{x+1}{x^2-9} = \frac{a}{x-3} + \frac{b}{x+3}$ true?
A. a=1, b=0 B. a=$\frac{1}{3}$, $b = \frac{3}{5}$ C. a= $-\frac{2}{5}$, b=1 C. $a = \frac{2}{3}$, $b = \frac{1}{3}$

34. What is the solution set of $\frac{2}{x} - \frac{x-2}{x^2-2x} = 1 - \frac{2x-2}{3x-2}$?

A. $\{-2,1\}$ B. $\{1,2\}$ C. $\{-1\}$ D. $\{1\}$

35. If the line with equation $4x + ky = 8$ is parallel to the line with equation $x + 2y = 0$, then the value of K is?
A. -8 B. 8 C. -2 D. 2

36. What is the distance from the point $(3,2)$ $to\ the\ line$ $4x + 3y = 13$?
A. 1 B. 2 C. 13/5 D.1/5

37. What is the angle between the lines pass through $(-1,3) and (2,3)$ and the line with equation $\sqrt{3}y - x + 7 = 0$?
A. 120^0 B. 60^0 C. 30^0 D. 45^0

38. What will be the equation of a circle that has center $(5,12)$ and it is tangent to the line with equation $2x - y + 3 = 0$?
A. $(x-5)^2 + (y-12)^2 = \frac{1}{5}$ $C. (x-5)^2 + (y-12)^2 = 5$
B. $(x-5)^2 + (y-12)^2 = \frac{1}{\sqrt{5}}$ $D. (x-5)^2 + (y-12)^2 = 2$

39. What is the focus of the parabola whose equation is $y^2 + 8x + 6y + 25 = 0$?
A. (-2,-3) B. (3,2) C. (-4,-3) D. (0,-2)

40. Which of the following is not true about an ellipse whose equation is given by $\frac{(x-1)^2}{9} + \frac{(y-2)^2}{4} = 1$?

A. The major axis is 6 C. The foci are $(1 \pm \sqrt{5}, 2)$
B. The latus rectum is $\frac{2\sqrt{76}}{9}$ D. The eccentricity is $\frac{\sqrt{5}}{3}$

41. Which of the following is true about the equation $3x^2 - 6x = y^2$
A. an ellipse with center at $(1,0)$
B. a hyperbola with center at $(0,1)$
C. an ellipse with center at $(-1,0)$
D. a hyperbola with one of its foci is$(1,0)$

42. Let p, q and r have truth values, F,F and T respectively, then which one of the following has a truth value "F"
A. lp A (q A r)
B. lp A (q ⇒ lr)
C. lq ⇒ (p vlr)
D. r - (p v q)

43. If p and q are equivalent prepositions then which of the following is tautology?
A. $p \wedge \neg q$ B. $\neg p \vee q$ C. $p \Rightarrow \neg q$ D. $\neg p \leftrightarrow q$

44. Let p(x)= $x^2 + x$ is a positive real number which of the following is equivalent to$\neg(\exists x p(x))$?

A. $(\forall x)(x^2 + x \leq 0)$
B. $(\exists x)(x^2 + x > 0)$
C. $(\forall x)(x^2 + x < 0)$
D. $(\exists x)(x^2 + x \leq 0)$

45. Let p= I pass the examination,
q=I study hard ,then which of the following represent the argument
"I pass the examination, if I study hard. I don't study hard there fore I pass the examination"
A. $P \Rightarrow q, \neg q \vdash p$
B. $p \Rightarrow q, q \vdash p$
C. $q \Rightarrow p, \neg q \vdash p$
D. $q \Rightarrow q, \neg q \vdash \neg p$

46. Which one of the following is a scalar matrix?
A. $\begin{pmatrix} 0 & 2 \\ 2 & 0 \end{pmatrix}$ B. $\begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix}$ C. $\begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$ D. $\begin{pmatrix} 0 & 0 \\ 1 & 1 \end{pmatrix}$

47. Let $A = \begin{pmatrix} x+y & x-y \\ 2 & a+b \end{pmatrix}, B = \begin{pmatrix} 2 & 6 \\ a-b & 8 \end{pmatrix}$ if A = B then which one is true?
A. a=3 B. x=4 C. y=2 D. b=-3

48. What is the n^{th} power of A= $\begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix}$?

A. $\begin{pmatrix} 1 & 4 \\ 0 & 1 \end{pmatrix}$ B. $\begin{pmatrix} 1 & 2^n \\ 0 & 1 \end{pmatrix}$ C. $\begin{pmatrix} 2n & 1 \\ 0 & 1 \end{pmatrix}$ D. $\begin{pmatrix} 1 & 2n \\ 0 & 1 \end{pmatrix}$

49. Which one of the following is not true about determinant of a square matrix?
A. If A and B are square matrix, then $\det(AB) = \det A \det B$.
B. For any square matrix A, $\det A^t = \det A$.
C. The determinant of a scalar matrix is the sum of its diagonal entries.
D. The determinant of a triangular matrix is the product of its diagonal entries.

50. Suppose A is 3X3 non-singular matrix, then what is $\det(2A^tA^{-1})$
A. 2 B. 8 C. 6 D. 4

51. Let $A = \begin{pmatrix} 2 & 4 & 6 \\ -1 & 2 & 0 \\ 0 & 6 & 5 \end{pmatrix}$, then what is the inverse of A

A. $\begin{pmatrix} \frac{5}{2} & 4 & -3 \\ \frac{5}{4} & \frac{5}{2} & -\frac{3}{2} \\ -\frac{3}{2} & -3 & 2 \end{pmatrix}$ B. $\begin{pmatrix} 10 & 16 & -12 \\ 5 & 10 & -6 \\ -6 & -12 & 8 \end{pmatrix}$ C. $\begin{pmatrix} 10 & 5 & -6 \\ 16 & 10 & -12 \\ -12 & -6 & 8 \end{pmatrix}$

D. $\begin{pmatrix} -\frac{5}{2} & -4 & 3 \\ -\frac{5}{4} & -\frac{5}{2} & \frac{3}{2} \\ \frac{3}{2} & 3 & 2 \end{pmatrix}$

52. The solution of the system of equation $\begin{cases} x_1 + 2x_3 = 0 \\ x_1 + x_2 + x_3 = 4 \\ x_1 + 4x_2 = 14 \end{cases}$ for x_1, x_2& x_3 respectively are?

A. 2, 3 & 1 B. 2, 3 & -1 C. 1, 2 & -1 D. -2, -3 & 1

53. Let $A = \begin{pmatrix} 8 & -6 & 0 \\ 0 & -4 & -9 \\ 9 & 6 & 5 \end{pmatrix}$ find a matrix B so that 2A-3B is identity matrix?

A. $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$ B. $\begin{pmatrix} 16 & -12 & 0 \\ 0 & -8 & -18 \\ 8 & 12 & 10 \end{pmatrix}$ C. $\begin{pmatrix} 8 & -6 & 0 \\ 0 & -4 & -9 \\ 9 & 6 & 5 \end{pmatrix}$

D. $\begin{pmatrix} 5 & -4 & 0 \\ 0 & -3 & -6 \\ 6 & 4 & 3 \end{pmatrix}$

54. For what value of x is $\begin{vmatrix} 1 & -3 \\ x & x-2 \end{vmatrix} = x + 1$?

A. 1 B. $\frac{3}{2}$ C. $\frac{1}{2}$ D.-1

55. $\frac{2i}{1-i} =$— A. i-1 B. 1-I C.1+I D. i

56. If the conjugate of (x+ yi)(1-2i) be 1+i then which one is true?
A. $y = \frac{3}{5}$ B. $x = \frac{1}{5}$ C. x-yi=$\frac{1-i}{1+2i}$ D. x+yi=$\frac{1-i}{1+2i}$

57. If $(\frac{1+i}{1-i}) = 1$ then the value of x is
A. x=4n, n∈ Z^+ B. x=4n+1, n∈ Z^+ C. x=2n, n∈ Z^+ D. x=2n+1,

58. $|(1 + i)(\frac{2+i}{3+i})|$=——A. 1 B.-1 C. ½ D. -1/2

59. What is the principal argument of z=-2+2$\sqrt{3}$i
A.$\frac{\pi}{3}$ B. -$\frac{2\pi}{3}$ C. $\frac{2\pi}{3}$ D.$\frac{\pi}{6}$

60. In the set of complex number what is the solution set $x^2 + 4x + 5$?
A{.} C. $\sqrt{8}^{50}(cos\frac{\pi}{4} + isin\frac{\pi}{4})$
B. $8^{50}(cos\frac{\pi}{4} + isin\frac{\pi}{4})$ D. $8^{50}(cos25\pi + isin25\pi)$

61. The multiplicative inverse of $\frac{1+2i}{1-i}$ is
A. $-\frac{3}{5} - \frac{i}{5}$ B. $-\frac{3}{5} + \frac{i}{5}$ C. $\frac{3}{5} - \frac{i}{5}$ D. $\frac{3}{5} + \frac{i}{5}$

62. If $\vec{A} = 2i - 3j$ and $\vec{B} = 3i$ find the unit vector in the direction of $\vec{A} - \vec{B}$?
A. –i-3j B. $-\frac{i}{\sqrt{10}} - \frac{3j}{\sqrt{10}}$ C. $-\frac{i}{10} - \frac{3j}{10}$ D. $-\frac{i}{\sqrt{10}} + \frac{3j}{\sqrt{10}}$

63. What is the product of $\vec{U} = 4i$ and $\vec{V} = 2i + 2j$
A. 8 B. -8 C. 0 D.4

64. Given the vector $\vec{U} = 3i + 2j$ and $\vec{V} = mi - j$ for what value of m is the angle between them is 45^0
A. -5 or 1/5 B. 1/5 or 5 C. -5 or -1/5 D. 5 or -1/5

65. What is the value of k if the vector $\vec{U} = -3i + kj$ and $\vec{V} = 2i + 10j$ are parallel?
A. 3/5 B. 15 C. -3/2 D. -15

66. If a translation T, takes the point A(1,-3) to B(3,2) then what is the image of the ellipse $4(x-2)^2 + 9(y+3)^2 = 36$
A. $(x-2)^2 + (y+3)^2 = 36$
B. $4(x-2)^2 + 9(y+3)^2 = 1$
C. $4(x-4)^2 + 9(y-2)^2 = 36$
D. $4(x+2)^2 + 9y^2 = 36$

67. What is the image of the point P(2,3) after it is reflected by the line $y=\sqrt{3}x$?
A. (3,2) B. $(-1 + \frac{3\sqrt{3}}{2}, \sqrt{3} + \frac{3}{2})$ C. $(2+\sqrt{3}, 3+\sqrt{3})$ D. $(1 - \frac{3\sqrt{3}}{2}, \sqrt{3})$

68. What is the image of (-2,3)after it is rotated through 270^0 about the origin in an anticlockwise direction?
A. $(-2,-3)$ B. $(-3,-2)$ C. $(-3,2)$ D. $(3,2)$

69. What is the image of a circle $(x-3)^2 + (y-1)^2 = 1$ whan it is rotated through $\theta = \pi$ about (-2,3) ?
A. $(x+2)^2 + (y-3)^2 = 1$
B. $(x+7)^2 + (y-5)^2 = 1$
C. $(x-5)^2 + (y+2)^2 = 1$
D. $(x-7)^2 + (y+5)^2 = 1$

70. Which of the following is true about $y = csc\ x$
A. Its Domain is IR
B. it is even function
C. its Asymptotes is $x=k\pi, k \in Z$
D. its range is $(-\infty, -1)U(1, \infty)$

71. $\cos^{-1}(\cos\frac{3\pi}{4}) =$——
A. $\frac{3\pi}{4}$ B. $\frac{\pi}{4}$ C. $-\frac{\sqrt{2}}{4}$ D. $\frac{\sqrt{2}}{4}$

Grade 12 - Sequence and Series

72. What are the first 5 terms of the sequence whose general term $a_n = \mathrm{n} + \mathrm{Cos}(\mathrm{n}\pi)$?

A. 3,2,5,4 7 B. 0,3,2,5,4 C. 4,7,6,9,8 D. 1,3,2,5,4

73. The 3^rd term of the sequence $\{a_n\}$ whose general term is $\mathrm{a_n} = \frac{4(-1)^{\mathrm{n}}}{1+\mathrm{n!}}$?

A. 6 B. -4/7 C.4/3 D. 5/7

74. What is the general term of the sequence $4, 9, 16, 25$ ... ?

A. $(-1)(n^2+1)$ B. $(n+1)^2$ C. $(-1)^n(n^2-1)$ D. $(-1)^{2n}(n^2+1)$

75. A sequence $\{\mathrm{a_n}\}$ is given by the formula $a_n = -3(5)^{2n-1}$ which of the number belongs to a_n?

A. -1875 B. 1875 C.1885 D. -1885

Hint Check wither each number satisfies the given formula $-3(5)^{2n-1}$ hence answer is D

76. If a_n is a sequence such that $a_1 = 2, a_2 = -1\ and\ a_n = 3a_{n-1} + 2a_{n-2}$ for n≥ 3, then what is a_6?

A.20 B. 6 C. 17 D. 12

77. Which one of the following is an arithmetic sequence?

A. 1,3,5,7,9,11,… B. 3,6,12,24,48,… C.-3,6,-9,12,-15,… D.3,6,10,15,21,…

78. What is the 10^{th} term of the arithmetic progression 2,7,12,…?

A. 10 B.47 C.56 D.27

79. Which term of the arithmetic progression $21,18,15,\ldots$ is -81?

A. 25 B. 35 C. 81 D. 15

80. How many two digit numbers are devisable by 3?

A. 15 B.20 C.30 D.13

81. In the arithmetic sequence, the n^{th} term is m and the m^{th} term is $2m - n$ then

the $k^{th}\ term$ is?

A.$a_k = m - n + k$ B. $a_k = m + n - k$ C. $a_k = n - m + k$ D. $a_k = m - n - k$

82. What is the sum of the multiple s of 4 that lies between 10 and 250?

A. 2600 B. 2360 C. 7860 D. 7800

83. What is the sum of the first 6 terms of the series $\frac{2}{3} - 1 + \frac{3}{2} - \frac{9}{2} + \cdots$?

A. $\frac{133}{48}$ B. $-\frac{133}{48}$ C. $\frac{48}{133}$ D. $-\frac{48}{133}$

84. In a geometric sequence $\{G_n\}, G_3 = 24$ and $G_6 = 192$ find the 10^{th}term?

A. 3072 B.4053 C. 3405 D. 4062

85. If$\{G_n\}$ a geometric sequence $G_2 = \frac{20}{9}$ and $G_5 = \frac{160}{243}$, find the general term of the sequence?

A. $5\left(\frac{2}{3}\right)$ B. $5\left(-\frac{2}{3}\right)^n$ C. $\frac{10}{3}\left(-\frac{2}{3}\right)^n$ D. $\frac{10}{3}\left(\frac{2}{3}\right)$

86. What is the value of $\sum_{n=2}^{20}\left(\frac{1}{n-1} - \frac{1}{n}\right)$

A. $\frac{19}{20}$ B. $\frac{17}{20}$ C. $\frac{21}{19}$ D. $\frac{20}{19}$

87. The sum of the finite series $\sum_{n=1}^{30}(-1)^n\left(\frac{1}{n} + \frac{1}{n+1}\right)$ i ?

A. $-\frac{29}{30}$ B. $\frac{29}{30}$ C. $\frac{30}{31}$ D. $-\frac{30}{31}$

88. What is the sum of the first 50 terms of the arithmetic sequence 3,10,17,24,… ?

A. 8750 B.8490 C.7850 D. 8725

89. If $\sum_{n=1}^{n}(2k+1) = 440\ then\ the\ value\ of\ n$ is?

A. 20 B. 22 C. 12 D.15

90. In an arithmetic progression $A_3 = 14$ and $A_6 = 35$ then the value of S_{10} is?

A. 315 B. 325 C. 350 D.320

91. In the arithmetic sequence, the $4^{th}\ term$ is 84 *and the* $10^{th}\ term$ is 60. What is the maximum possible partial sum of the sequence?

A.1152 B. 1200 C. 1440 D. 1250

92. If the n^{th} partial sum of arithmetic sequence is $n^2 + 9n$ What is the 10th andthe nth term of the sequence respectively?

A. 20, $a_n = 2n + 10$ B. 28, $a_n = 2n + 8$ C. 190, $a_n = n^2 + 9n$ D. 28, $a_n = n^2 - 72$

93. What is the sum of the series $\sum_{n=0}^{\infty} 3^n 2^{-2n}$?

A. -3 B. ¼ C. 4 D. -1/3

94. What is the sum of the first 8 terms of the geometric progression: 3,-6,12,-24,…?

A.245 B.255 C.-245 D. -255

95. A person has two parents four grand- parents and eight great grandparents and so on. What is the number of his ancestors during the ten generations preceding his own?

A. 1028 B. 4096 C. 2048 D. 2046

96. What is the sum of the infinite series $\sum_{n=1}^{\infty} (\frac{2^k+5}{10^k})$?

A. $\frac{5}{4}$ B. $\frac{3}{5}$ C. $\frac{4}{5}$ D. $\frac{5}{3}$

97. What is the value of $\lim_{x\to 4} \frac{\sqrt{x}-2}{x^2-4x}$? A $\frac{1}{16}$ B. 16 C. 0 D. ∞

98. The value of the $\lim_{x\to 9} \frac{3-\sqrt{x}}{x^2-81}$ i ? A . $\frac{1}{108}$ B. $-\frac{1}{108}$ C. 108 D. -108

99. What is the limit, $\lim_{x\to a} \frac{x^2-a^2}{x^4-a^4}$? A. $2a^2$ B. $\frac{1}{2a^2}$ C. $-2a^2$ D. $-\frac{1}{2a^2}$

100. What is the value of $\lim_{x\to\infty} \frac{4^n-2}{10^2}$? A . $\frac{11}{12}$ B. $\frac{1}{5}$ C. $\frac{2}{3}$ D. ∞

101. What is the value of $\lim_{x\to 5} \frac{x-5}{\sqrt{x+4}-3}$? A .$\infty$ B. 0 C 1 D. 6

102. What is the value of $\lim_{x\to\infty} (1+\frac{1}{x})^{2x+4}$? A . e B.e^{-1} C. e^2 D.1

103. Let f(x)= $\begin{cases} a-\cos x, \text{if } x \le 0 \\ 3e^x - a, \text{if } x > 0 \end{cases}$ for what value of a is the function f is continuous at x=0?

A.3 B.2 C.0 D.1

104. The $\lim_{x\to 1} \frac{x^3+x-2}{x^2-x}$? A. 4 B. 8 C. ∞ D. 0

105. What is the value of $\lim_{x\to\pi} \frac{xSi(2x)}{x-\pi}$? A. 2π B. π C.$-\pi$ D. -2π

106. Find $\lim_{x\to\infty} (\frac{x}{x+1})^{-3x}$? A . e^{-3} B. e^3 C. e^6 D. e^{-6}

107. Let f(x)= $\begin{cases} \frac{a\sin(2x)}{x}, \text{ if } x < 0 \\ e^{2x} - 2, \text{if } x \ge 0 \end{cases}$ if x is continuous at x=0 then what is the value of a?

A. ½ B. -1/2 C. 2 D. -2

108. The value of the $\lim_{x\to\frac{\pi}{2}} \frac{t(2x)}{x-\frac{\pi}{2}}$ =——? A. 4 B. 2 C. ∞ D. 1

109. What is the value of $\lim_{x\to 0} (\frac{x^2-5}{x}) Sinx$? ——? A. $\frac{1}{5}$ B. -5 C. ∞ D. 0

110. Evaluate $\lim_{n\to\infty} \frac{3n-Cos\ (2n)}{2-n}$? A. 2 B. -3 C. ∞ D. $\frac{2}{3}$

111. Suppose that f and g are continuous function such that $f(2) = 1$ and $\lim_{n\to 2}(f(x) + (x)) = 13$, then (2) is equal – ?

A. 13 B. 12 C. 3 D. 10

112. The left hand limit, $\lim_{x\to 0^-}\frac{4x+|x|}{2x-|x|}$ is equal to A. 1 B. 5/3 C. 5 D. 3/2

113. What is the limit, $\lim_{x\to a}\frac{x^{-2}-a^{-2}}{x^{-3}-a^{-3}}$? A. $\frac{2}{3a}$ B. $\frac{3a}{2}$ C. $\frac{3}{2a}$ D. $\frac{2a}{3}$

114. Let f(x) = $-\sqrt{25-x^2}$, then what is the value of $\lim_{x\to 1}\frac{f(x)-f(1)}{x-1}$?

A. $\frac{1}{24}$ B. $\frac{\sqrt{24}}{24}$ C. -24 D. $\sqrt{24}$

115. The value of the $\lim_{x\to 0}\frac{1-C(2x)}{x^2}$ *is equal* ? A. 4 B.2 C.1 D.0

116. Which one of the following is equal to $\lim_{x\to 2}\frac{\sqrt{x}-\sqrt{2}}{x^2-4}$?

A. $8\sqrt{2}$ B. $4\sqrt{2}$ C. $\frac{1}{4\sqrt{2}}$ D. $\frac{1}{8\sqrt{2}}$

117. Let f(x)=$\begin{cases} 5a-x, \text{if } x<1 \\ b+2, \text{if } x=1 \\ ax, \text{ if } x>1 \end{cases}$ then what is the value of b if f is continuous at x=1?

A. $-\frac{7}{4}$ B. $\frac{4}{7}$ C. $\frac{-3}{5}$ D. $\frac{1}{4}$

Grade 12 unit 3 & 4 - Derivatives

118. The derivative of f(x)=$\frac{2-x}{3x+1}$ i ? A. $\frac{-7}{(3x+1)^2}$ B. $\frac{6x-5}{(3x+1)^2}$ C. $\frac{9}{(3x+1)^2}$ D. $\frac{7}{(3x+1)^2}$

119. The $4^{th} and\ n^{th}$ derivative of f(x)=e^{nx} respectively are ?

A. $^4e^{nx}, n^ne^{nx}$ B. n^4e^x, ne^{nx} C. n^4e^{nx}, n^ne^x D. $n^4e^{nx}, n!\ e^{nx-1}$

120. What is the equation of the line tangent to the graph $of\ f(x) = \frac{3x}{x-2}\ at\ (1, f(1))$?

A. y=-6x+3 B. y=6x+3 C. 6x-3 D. y=-6x-3

121. Let k(x)=ƒ($\sqrt{4x+1}$). If f ''(3)=1⁄2, then k „(2)= ——?

A. 3 B. 12 C. 1/3 D.4

122. Write the equation of the line tangent to the graph of the function

f(x) = $\begin{cases} x-\pi, x \le 0 \\ 1-2sinx, x > 0 \end{cases}$ at $(\pi, f(\pi))$.

A. y=2x-2 $\pi - 1$ B. y=2x+2 $\pi + 1$ C. y=2x-2 $\pi + 1$ D. y= -2x-2 $\pi + 1$

123. For what value of a and b is the function f(x)=$\begin{cases} 1-3x^2, for\ x \le 1 \\ ax+b, for\ x > 1 \end{cases}$ is differentiable at x=1?

A. a=-6, b=4 B. a=6, b=-4 C. a=4, b=-6 D. a=-4, b=6

124. Find the equation of the line tangent to the graph of f(x)=$e^xSinx\ at\ x = 0$.

A. y=x B. y=-x C. y=2x D. y=-2x

125. Let f(x)=Cos(3x), then what is the value of ƒ′ $(\frac{\pi}{9})$?

A. $\frac{3\sqrt{3}}{2}$ B.– $\frac{3\sqrt{3}}{2}$ C. $\frac{\sqrt{3}}{2}$ D. $-\frac{\sqrt{3}}{2}$

126. If g(x)=f($x^2 + x$), $f(2) = -2\ and\ f''(2) = 3\ then\ g''(1) = -$?

A. 27 B. 4 C.23 D.17

127. What is the second derivative of $f(x) = e^{2x}Sinx \ at \ x = 0$?

A. 1 B.4 C. 0 D.3

128. For what value of k will $f(x) = x + \frac{k}{x}$ $have\ a\ relative\ maxium\ at\ x = -2$?

A.-4 B.-2 C. 2 D. 4

129. If $sin\ x = e^{y}, 0 < x < \pi, what$ is $\frac{dy}{dx}$ $interms\ of\ x$?

A. –tan x B. –cot x C. cot x D. tan x

130. If y=$cos^2x - sin^2x, then\ \frac{dy}{dx}$=——?

A. -1 B. 0 C. -2 Sin(2x) D. -2(Cos x +Sin x)

131. If $f(x) = xln(x^2)$, then what is the first derivative of f?

A. $(x^2) + 1$ B. $ln(x^2) + 2$ $C.\ (x^2) + \frac{1}{x}$ $D.\frac{1}{x^2}$

132. The absolute maximum value of $f(x) = x^3 - 3x^2 + 12$ on the closed interval $[-2.4]$ occurs at x =—? A. 4 B.2 C. 1 D. 0

133. If y=2x-8, what is the minimum value of the product of x and y ?

A. -16 B.-8 C. -4 D. 0

134. If f(x)= $e^{5x}Cosx + \frac{x-\pi}{x^2+3}$,then f ‟(0) is equal to——?

A. 5--$\frac{\pi}{2}$ B. $\frac{16}{3}$ C. $\frac{2}{9}$ D. $\frac{7}{3}$

135. Given the function $f(x) = x^3 + 6x^2 + 9x + 4$ which one of the following is not TRUE about the function f?

A. f is increasing on $(-\infty, -3]U\ [-1, \infty)$

B. f is decreasing on [-3,-1]

C. the graph of f is concave upward on(-2, ∞) and concave downward on(-∞, -2)

D. Its inflection point is (-2,9)

136. The volume of a cylindrical tin can with closed on top and bottom is 32 π cubic unit. If a minimum amount of tin is used to construct the can, what must be the height of the can?

A. $2\sqrt[3]{2}$ B. $2\sqrt{2}$ C.$4\sqrt{2}$ D. $4\sqrt[3]{2}$

Grade 12 unit 5 - Integration

137. If $f'(x) = \frac{1}{x} + x \; and \; f(1) = \frac{5}{2}$, then a formula for f(x) is—?

A. $\ln|x| + \frac{x^2}{2} + 2$ B. $\ln|x| + \frac{x^2}{2} + 1$ C. $\ln|x| - \frac{x^2}{2} + 2$ D. $\ln|x| - \frac{x^2}{2} + 1$

138. $\int x^2\sqrt{x^3 - 8}\, dx$ is *equal to*—?

A. $\frac{1}{3}(x^3 - 8)^{\frac{1}{2}} + c$ B. $\frac{2}{9}(x^3 - 8)^{\frac{3}{2}} + c$ C. $\frac{1}{2}(x^3 - 8)^{\frac{1}{3}} + c$ D. $\frac{2}{9}(x^3 - 8)^{\frac{5}{2}} + c$

139. If $f'(x) = \frac{1}{x} - 2x + 2 \; and \; f(1) = 2$, then a formula for f(x) is—?

A. $-\frac{1}{x^2} - x^2 + 2x - 1$ C. $-\frac{1}{x^2} - x^2 + 2x + 1$

B. $\ln|x| - 2x + 2$ D. $\ln|x| - x^2 + 2x + 1$

140. Which of the following is equal to $\int xsinx\, dx$?

A. $x^2cosx + c$ C. $x^2sinx - xcosx + c$

B. $-sinx + x^2cosx + c$ D. $Sinx - xcosx + c$

141. $\int \left(\frac{}{x+1}\right)^2 dx =$———?

A. $x + \ln|x + 1| + c$ C. $x - \frac{1}{x+1} - 2\ln|x + 1| + c$

B. $\frac{1}{3}x + \frac{1}{3}\ln|x + 1| + c$ D. $x - \frac{2}{(x+1)^2} - \frac{1}{x+1} + c$

142. What is the volume of the solid generated by the graph of $f(x) = 3^x$ and the x-axis between $x = 0$ & $x = 1$ about the x-axis in cubic units?

A. $8\pi \ln 3$ B. $4\pi log_3 e$ C . $4\pi \ln 3$ D. $8\pi log_3 e$

143. If $\int_0^1 \sqrt{1 - x^2} = \frac{\pi}{4}$ *then the val;ue 0f* $\int_0^1 \left(4\sqrt{1 - x^2} + 2\right) dx$ is

A. $2\pi + 4$ B. $2\pi + 2$ C. $\pi + 2$ D. $\pi + 8$

144. If $\int_{-1}^{4} f(x)dx = 4\ and\ \int_{2}^{4}(3 - f(x))dx = 7\ then\ the\ value\ of\ \int_{2}^{-1} f(x)dx$ is?

A.-5 B. -3 C. 5 D.3

145. What is the area of the region enclosed by the graph of $y = x$ and $y = x^2 - 3x + 3$ in square unit?

A. $27/3$ B. 2 C. 64/3 D. 34/3

146. What is the area of the region bounded by the curve $y = e^{3x}$ and the line $x = 1, x = 4$ and $y = 0$ in square unit?

A. $\frac{1}{3}e^3(e^9 - 1)$ B. $^3(e^9 - 1)$ C. $e^{12} - 1$ $^3(e^9 - 1)$