CHAPTER NO 1 (HSSC – II)

1) The term _____was recognized by a German Mathematician Leibniz to describe the dependence of one quantity on another.
A. Limit B. Function C. Domain D. Range

2) The term function was recognized by the German mathematician _____?
A. Euler B. Newton C. Laplace D. Leibniz

3) Swiss Mathematician _____invented a symbolic way to write the statement " y is a fucntion of x" as $y = f(x)$.
A. Euler B. Leibniz C. Tailor D. Cauchy

4) Functions are used to explain the relationship between _____
A. Variable quantities B. Notations
C. Values D. None of these

5) A rule that assigns to each element "x" in X a unique element "y" in Y is called a function from
A. X to X B. X to Y C. Y to X D. Y to Y

6) A function from Y to X is denoted by
A. $f: X \to X$ B. $f: Y \to X$ C. $f: X \to Y$ D. $f: Y \to Y$

7) If $f: x \to x^2$ is a function, then
A. $f(x) = x$ B. $f(x) = x^2$ C. $f(x) = x^3$ D. $f(x) = -x^2$

8) If $f: X \to Y$ is a function, then domain of f is
A. Y B. X C. $-X$ D. $-Y$

9) If $f: X \to Y$ is a function, then the elements of X are called
A. Pre − Images B. Images C. Constants D. Ranges

10) Let $A = \{3,5,7,-9\}$, B={0,1,-3} then R={(3,0),(5,1),(7,-3),(-9,0)} then domain of R=?
A. $\{0,1,-3,0\}$ B. $\{0,1,-3\}$
C. $\{3,5,7,-9\}$ D. $\{3,5\}$

11) If $f: X \to Y$ is a function, then the subset of Y containing all images is called the
A. domain of f B. range of f C. subset of X D. superset of X

12) If $f: x \to -x^2$ is a function, then $f(2) =$
A. -4 B. -2 C. 2 D. 4

13) If $f: x \to x - 3$ is a function, then $f\left(\frac{1}{2}\right) =$
A. $-\frac{7}{2}$ B. $-\frac{5}{2}$ C. $-\frac{3}{2}$ D. $-\frac{1}{2}$

14) If $f: x \to \frac{2x^2+5x-1}{x+3}$ is a function, then $f(0) =$
A. $-\frac{1}{3}$ B. $-\frac{1}{4}$ C. $-\frac{1}{5}$ D. 0

15) If $f: x \to \cos x$ is a function, then $f(\pi) =$
A. -1 B. $-\frac{1}{2}$ C. $\frac{1}{2}$ D. 1

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16) If $(x) = x^3 - 2x^2 + 4x - 1$ then which of the following represents $f(1 + x)$?

A. $x^3 + x^2 + 3x + 2$ B. $x^3 + x^2 - 3x + 2$
C. $x^3 + x^2 + 3x - 2$ D. $x^3 - x^2 + 3x + 2$

17) If $f(x) = \sqrt{\cos(2\pi \sin x)}$, then $f\left(\frac{\pi}{2}\right) =$

A. -1 B. 0 C. 1 D. $\sqrt{2}$

18) Given $f(x) = x^2 + 3$ then $f(a + b) =$?

A. $a^2 + b^2 + 2ab + 3$ B. $a^2 + b^2 - 2ab - 3$
C. $a^2 + b^2 - 3ab$ D. $x^2 + 3$

19) If $f(x) = 4x - x^2$, then $f(a + 1) - f(a - 1)$ is equal to

A. $4(2 - a)$ B. $2(4 - a)$ C. $4(2 + a)$ D. $2(4 + a)$

20) If $f(x) = x^3 + 2x^2 - 1$, then $\frac{f(1+h)-f(1)}{h} =$

A. h B. $h^2 - 5h + 7$
C. $h^2 + 5h + 7$ D. $h^2 + 5h - 7$

21) A function $f: R \to R$ is defined by $f(x) = \begin{cases} 1, & \text{if } x \in Q \\ -1, & \text{if } x \in Q' \end{cases}$ then $f(\pi) - f\left(\frac{22}{7}\right) =$?

A. 0 B. 2 C. -2 D. None of these

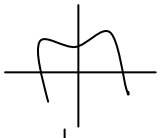
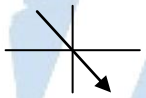
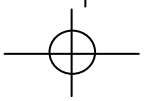
22) If $f(x) = x^2 - \frac{1}{x^2}$ then $f =$?

A. $-f\left(\frac{1}{x}\right)$ B. $f\left(\frac{1}{x}\right)$ C. $f(x)$ D. $f(x^2)$

23) If $f(x) = Ax^2 + Bx + C$ and $f(x + 1) - f(x) = 8x + 3$ then;

A. $A = 2, B = 1$ B. $A = 4, B = -1$
C. $A = -1, B = 4$ D. $A = -1, B = 1$

24) Which of the following cannot be the graph of a function?

A. 
B. 
C. 
D. 

25) If $f(x) = \frac{x}{x^2-4}$, then f is not defined at $x =$ _____ ?

A. $4, -4$ B. $1, -1$ C. $2, -2$ D. 0

26) The domain of $y = \sqrt{-x}$ is;

A. $(0, \infty)$ B. $[0, \infty)$ C. $(-\infty, 0)$ D. $(-\infty, 0]$

27) If $f(x) = \sqrt{x^2 - 4}$, then domain of f is

A. $(-\infty, -2] \cup [2, \infty)$ B. $(-\infty, \infty)$
C. $[-2, 2]$ D. $[-3, 3]$

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28) Domain of $f(x) = \sqrt{x^2 - 9}$ is:

A. $R - (-3, 3)$ B. $R - [-3, 3]$ C. $[3, \infty]$ D. $(-\infty, -3]$

29) Choose domain of the function represented by $f(x) = \sqrt{1 - x}\ \ln x$

A. $(-\infty, 0]$ B. $[0,1)$ C. $(0, +\infty)$ D. $(0,1]$

30) If domain of $f(x) = +\sqrt{4 - x^2}$ is $[-2,2]$ then which of the following is the graph of f(x)?

A. $Semi - circle$ B. Square

C. Circle D. Hyperbola

31) The domain of definition of the function $y = \frac{1}{\sqrt{16-x^2}}$ is_____

A. $(-4,4)$ B. $[-4,4]$ C. $R - (-4,4)$ D. $(4, \infty)$

32) What is the domain of the function $f(x) = \frac{x-1}{x-4}$?

A. R B. $R - \{1\}$ C. $R - \{4\}$ D. $R - \{-4\}$

33) The domain of the function $f(x) = \frac{|x+2|}{x+2}$ is;

A. $\mathbb{R} - \{2\}$ B. $\mathbb{R}$ C. $\mathbb{R} - \{\pm 2\}$ D. $\mathbb{R} - \{-2\}$

34) The domain of the function $g(x) = e^{\sqrt{x^2-1}}. \ln(x - 1)$is;

A. $(1, \infty)$ B. $[1, \infty)$ C. $\mathbb{R} - \{1\}$ D. $[1, \infty]$

35) The range of the function $f = \{(1, x), (2, y), (3, z)\}$ is_____

A. $\{1, x, z\}$ B. $\{1, y, z\}$ C. $\{1,2,3\}$ D. $\{x, y, z\}$

36) If $f(x) = |x|$, then range of f is

A. $(-\infty, 0]$ B. $[0, \infty)$ C. $(-\infty, \infty)$ D. None of these

37) If $f(x) = |x - 2|$, then range of f is

A. $(-\infty, 0]$ B. $[0, \infty)$ C. $(-\infty, \infty)$ D. None of these

38) Range of $f(x) = x^2 - 1 \quad \forall x \in \mathbb{R}$ is: ,

A. $\mathbb{R}$ B. $\{-1,1\}$ C. $[0, \infty)$ D. $[-1, \infty)$

39) Find the range of the function $y = f(x) = 2 + \sqrt{x - 1}$

A. $2 \leq y < \infty$ B. $3 \leq y < \infty$ C. $1 \leq y < \infty$ D. $-1 \leq y < \infty$

40) The range of the function $f(x) = \frac{1+x^2}{x^2}$ is_____

A. $[0,1]$ B. $(0,1)$ C. $(1, \infty)$ D. $[1, \infty]$

41) Range of cotx is_____.

A. $(0, \infty)$ B. R C. $(-\infty, 0)$ D. $[-1, 1]$

42) The range of the function $y = \cosh x$ is_____

A. $(-\infty, +\infty)$ B. $[1, +\infty)$ C. $(1, +\infty)$ D. $[0, +\infty)$

43) If P is the perimeter of a sqaure and A is its area, then P =

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

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44) If P is the perimeter of square and A its area then A =?

A. $\frac{P^2}{4}$ B. $\frac{P^2}{8}$ C. $\frac{P^2}{16}$ D. $16P^2$

45) If A is the area of the circle and C is its circumference C, then A =

A. $\frac{1}{8\pi}C^2$ B. $\frac{1}{4\pi}C^2$ C. $\frac{1}{2\pi}C^2$ D. πC^2

46) If A is the area of the circle and C is its circumference C, then C =

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

47) The area of a square of side length 2 is

A. 2 square units B. 4 square units
C. 8 square units D. 16 square units

48) The volume of a cube of side length 2 is

A. 2 cubic units B. 4 cubic units
C. 8 cubic units D. 16 cubic units

49) Volume of a sphere depends on its_____.

A. π B. $\frac{4}{3}$ C. Radius D. Centre

50) $f(x) = x^2 - 4x + 1$ is

A. trigonometric function B. logarithmic function
C. exponential function D. algebraic function

51) $f(x) = ax + b, a \neq 0$ is

A. trigonometric function B. cubic function
C. quadratic function D. linear function

52) The graph of a linear function is

A. parabola B. ellipse
C. hyperbola D. straight line

53) If $f: X \to X$ defined by $f(x) = x, \forall x \in X$ is called the

A. trigonometric function B. cubic function
C. quadratic function D. identity function

54) The linear function $f(x) = ax + b$ is an identity function if

A. $a = 0, b = 1$ B. $a = 1, b = 0$
C. $a = 1, b = 1$ D. $a = 0, b = 0$

55) The function $f: x \to 1$ is

A. constant function B. cubic function
C. quadratic function D. identity function

56) If k is a constant, then the function $f: x \to k$, is

A. constant function B. cubic function
C. quadratic function D. identity function

57) For what value of a and b, the function $f(x) = ax + b$, will become a constant function ?

A. $a = 1, b = 1$ B. $a \neq 0, b = 1$ C. $a = 1, b = 0$ D. $a = 0, b \neq 0$

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58) $y = \sin x$ is a_____

A. Linear function B. Constant function
C. Rational function D. Trigonometric function

59) $\operatorname{sech}^2 x =$

A. $1 + \tanh^2 x$ B. $1 - \tanh^2 x$ C. $1 - \coth^2 x$ D. $\coth^2 x - 1$

60) $\operatorname{cosech}^2 x =$

A. $1 + \tanh^2 x$ B. $1 - \tanh^2 x$ C. $1 - \coth^2 x$ D. $\coth^2 x - 1$

61) A function in which the variable appears as exponent is called a/an_____.

A. Rational function B. Exponential function
C. Hyperbolic function D. Inverse function

62) $y = e^{2x}$ is called a/an_____function.

A. Linear B. Quadratic C. Rational D. Exponential

63) $f(x) = \log x$ is

A. trigonometric function B. logarithmic function
C. exponential function D. algebraic function

64) $\sinh x =$

A. $\frac{e^x + e^{-x}}{2}$ B. $\frac{e^x - e^{-x}}{2}$ C. $\frac{e^x - e^{-x}}{e^x + e^{-x}}$ D. $\frac{e^x + e^{-x}}{e^x - e^{-x}}$

65) $\cosh x =$

A. $\frac{e^x + e^{-x}}{2}$ B. $\frac{e^x - e^{-x}}{2}$ C. $\frac{e^x - e^{-x}}{e^x + e^{-x}}$ D. $\frac{e^x + e^{-x}}{e^x - e^{-x}}$

66) $\tanh x =$

A. $\frac{e^x + e^{-x}}{2}$ B. $\frac{e^x - e^{-x}}{2}$ C. $\frac{e^x - e^{-x}}{e^x + e^{-x}}$ D. $\frac{e^x + e^{-x}}{e^x - e^{-x}}$

67) $\coth x =$

A. $\frac{e^x + e^{-x}}{2}$ B. $\frac{e^x - e^{-x}}{2}$ C. $\frac{e^x - e^{-x}}{e^x + e^{-x}}$ D. $\frac{e^x + e^{-x}}{e^x - e^{-x}}$

68) $\frac{e^x + e^{-x}}{e^x - e^{-x}} = ?$

A. $\tanh x$ B. $\coth x$ C. $\coth^{-1} x$ D. $\operatorname{cosech} x$

69) $\cosh^2 x - \sinh^2 x$ is equal to:

A. 1 B. e^x C. $\cosh 2x$ D. $\tanh x$

70) $\cosh^2 x + \sinh^2 x =$

A. $-\cosh 2x$ B. $\sinh 2x$ C. $\tanh 2x$ D. $\cosh 2x$

71) $\sinh^{-1} x =$

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

72) $\cosh^{-1} x =$ _____.

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

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73) $\tanh^{-1}x =$

A. $\ln\left(x+\sqrt{x^2+1}\right)$ B. $\ln\left(x+\sqrt{x^2+1}\right)$

C. $\frac{1}{2}\ln\left(\frac{1+x}{1-x}\right)$ D. $\frac{1}{2}\ln\left(\frac{x+1}{x-1}\right)$

74) $\coth^{-1}x =$

A. $\ln\left(x+\sqrt{x^2+1}\right)$ B. $\ln\left(x+\sqrt{x^2+1}\right)$

C. $\frac{1}{2}\ln\left(\frac{1+x}{1-x}\right)$ D. $\frac{1}{2}\ln\left(\frac{x+1}{x-1}\right)$

75) $\text{sech}^{-1}x =$

A. $\ln\left(x+\sqrt{x^2+1}\right)$ B. $\ln\left(\frac{1}{x}+\frac{\sqrt{1-x^2}}{x}\right)$

C. $\frac{1}{2}\ln\left(\frac{1+x}{1-x}\right)$ D. $\frac{1}{2}\ln\left(\frac{x+1}{x-1}\right)$

76) $\text{cosech}^{-1}x =$

A. $\ln\left(x+\sqrt{x^2+1}\right)$ B. $\ln\left(\frac{1}{x}+\frac{\sqrt{1-x^2}}{x}\right)$

C. $\frac{1}{2}\ln\left(\frac{1+x}{1-x}\right)$ D. $\ln\left(\frac{1}{x}+\frac{\sqrt{1+x^2}}{|x|}\right)$

77) A function of the form $f(x,y)=0$ is called _____function.

A. Parametric B. Implicit C. Explicit D. Identity

78) $x^2+xy+y^2=2$ is a/an_____

A. Implicit function B. Inverse function

C. Explicit function D. Constant function

79) Which of the following is an implict function?

A. $y=x-1$ B. $y-1=x^2$

C. $x^2+y+2=0$ D. $x^2+xy+y^2=9$

80) Equations $x=3\cos t$ and $y=3\sin t$ reprsent the equation of

A. line B. circle C. parabola D. hyperbola

81) The graph of the parametric equations $x=t^2$ and $y=t$
When $-2\le t\le 2$ represent_____

A. Circle B. parabola C. ellipse D. straight line

82) For parametric equations $x=at^2$; $y=2at$ represent the equation:

A. $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ B. $x^2+y^2=1$ C. $y^2=4ax$ D. $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

83) $x=a\cos\theta, y=b\sin\theta$ are parametric equations of

A. circle B. parabola C. ellipse D. hyperbola

84) $x=a\sec\theta, y=b\tan\theta$ are the parametric equation of:

A. Ellipse B. Circle C. Hyperbola D. Parabola

85) If $f(-x)=f(x)$ for every number x in the domain of f, then f is

A. linear function B. periodic function

C. odd function D. even function

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86) Which of the folloiwng is an even function?

A. $f(x) = \cos x - \frac{x}{2}$ B. $f(x) = \frac{1-\cos x}{\sin^2 x}$

C. $f(x) = \frac{x^2-16}{x-4}$ D. $f(x) = (x-5)^2$

87) $f(x) = \cos x$ is

A. linear function B. quadratic function

C. odd function D. even function

88) $f(x) = \sec x$ is

A. linear function B. quadratic function

C. odd function D. even function

89) $f(x) = x\cot x$ is

A. linear function B. quadratic function

C. odd function D. even function

90) Which of the following defines a fucntion "f" f or $f(-x) = -f(x)$?

A. $f(x) = \log x$ B. $f(x) = x^2$

C. $f(x) = \sin x$ D. $f(x) = \cos x$

91) $f(x) = \cos x \sin x$ is

A. odd function B. quadratic function

C. linear function D. even function

92) Which of the following equations represents an odd function?

A. $f(x) = \frac{3x}{x^2+1}$ B. $f(x) = 3x^4 - 2x^2 + 7$

C. $f(x) = \sin x + \cos x$ C. $f(x) = (x+2)^2$

93) The function $f(x) = (x+2)^2$ is

A. even function B. odd function

C. both even and odd D. nether even nor odd

94) If $f(x) = 4x^2 + xy + y^2 - 7$ then f(x)is (an)_____

A. Even B. odd

C. both even and odd D. Neither even nor odd

95) If $f(\theta) = 2\sin\theta + 3\cos\theta$ then $f(\theta)$is a/an_____

A. Odd function B. Even function

C. Hyperbolic function D. None of these

96) If $f = 2x + 1$ and $g(x) = \frac{3}{x-1}$, then $(f \circ g)(x) =$

A. $\frac{x+5}{x-1}$ B. $\frac{3}{2x}$ C. $\frac{6x+3}{x-1}$ D. $x + 3$

97) If $f(x) = 4x + 5, g(x) = 3x + 7$ then $f(g(x)) =$?

A. $12x + 28$ B. $12x + 33$ C. $4x - 31$ D. $25x + 34$

98) If $f(x) = (-x+9)^3$ and $g(x) = 6$ then which of the following represents g[f(x)]

A. $(-x+9)^3$ B. 6 C. 27 D. -27

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99) If $f(x) = 2x + 1$ and $g(x) = x^2 - 1$ then which one of the following defines $g \circ f\,(x)$?

A. $4x^2 - 4x$ B. $4x^2 + 2x$

C. $(2x + 1)^2 + 1$ D. $(2x + 1)^2 - 1$

100) If $f(x) = 2x + 1, g(x) = x^2 - 1$, then $g \circ g(x) =$ _____ ?

A. $x^2 - 2x^4$ B. $x^4 - 2x^2$ C. $2x^2 - 1$ D. $x^2 - 1$

101) For real valued function $f(x) = 2x + 1$ what wil be $f \circ f(x)$?

A. $3x - 4x$ B. $2x - 1$ C. $2x + 1$ D. $4x + 3$

102) If $f(x) = \frac{1}{x^2}$ then which of the following is equal to $f \circ f(x)$.

A. x^4 B. x^2 C. 1 D. $\frac{1}{x^4}$

103) If $f(x) = \sin x$ and $g(x) = \cos x$, then $(f \circ g)(x) =$

A. $\sin x \cos x$ B. $\tan x$ C. $\sin(\cos x)$ D. $\cos(\sin x)$

104) If $f(x) = \sin x$ and $g(x) = \frac{1}{\tan x}$, then $(f \circ g)(x) =$

A. $\cot(\sin x)$ B. $\sin(\cot x)$ C. $\sin(\tan x)$ D. $\cos(\tan x)$

105) If $f(x) = \sin x$ and $g(x) = \sin^{-1} x$ then_____

A. $(gof)x = \sin^{-1}(\sin x)$ B. x

C. $\sin x + \sin^1 x$ D. None of these

106) If $f(x) = \sqrt{\cot^{-1} x}$ and $g(x) = \ln x$, then $(f \circ g)(x) =$

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

107) $f: x \to \sqrt{3x^2 - 1}$ and $g: x \to \sin x$, then $f \circ g: x \to$

A. $\sin(3x^2 - 1)$ B. $\sin\sqrt{3x^2 - 1}$

C. $\sqrt{3\sin^2 x - 1}$ D. $\sqrt{3x^2 - 1}\sin x$

108) If $f(x) = -2x + 6$, then $f^{-1}(x) =$

A. $\frac{2-x}{6}$ B. $\frac{2}{6-x}$ C. $\frac{6-x}{2}$ D. $2x - 6$

109) if $f(x) = \frac{2x+1}{2x-1}$ then $f^{-1}(x) =$?

A. $\frac{1}{2}\left(\frac{x+1}{x-1}\right)$ B. $\frac{1}{2}\left(\frac{x-1}{x+1}\right)$ C. $\frac{1}{2}\left(\frac{x+2}{x-2}\right)$ D. None of these

110) If $f(x) = \frac{1}{2-\sin 3x}$, then $f^{-1}(x) =$

A. $\frac{1}{3}\sin^{-1}\left(\frac{x}{2x-1}\right)$ B. $\frac{1}{3}\sin\left(\frac{2x-1}{x}\right)$

C. $\frac{1}{3}\sin^{-1}\left(\frac{2x-1}{x}\right)$ D. $2 - \sin 3x$

111) If $f(x) = \ln x$, then $f^{-1}(x) =$

A. $\sin x$ B. $\cos x$ C. $\ln x$ D. e^x

112) If $f(x) = e^x$, then $f^{-1}(x) =$ _____.

A. e^x B. $\sin x$ C. $\cos x$ D. $\ln x$

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113) If $f(x) = \frac{x-1}{x+1}, x \neq -1$ then $f^{-1}(x) = ?$

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

114) If $f(x) = \sin(\coth^{-1}x)$, then $f^{-1}(x) =$

A. $\coth^{-1}(\sin x)$ B. $\coth(\sin^{-1}x)$
C. $\coth(\sin x)$ D. $\sin(\coth x)$

115) If $f(x) = -2x + 8$, then $f^{-1}(-1) =$

A. $\frac{9}{2}$ B. $\frac{7}{2}$ C. $\frac{2}{9}$ D. 0

116) What is the value of $f^{-1}(6)$ if $f(x) = 5x + 1$?

A. 31 B. -1 C. 1 D. $\frac{7}{5}$

117) If $f(x) = \frac{2x+1}{x-1}$, then $f^{-1}(3) =$

A. $f^{-1}(3) < f^{-1}(1)$ B. $f^{-1}(3) > f^{-1}(1)$
C. $f^{-1}(3) = f^{-1}(1)$ D. None of these

118) If $f(x) = \sqrt{2\tan x}$, then $f^{-1}(\sqrt{2}) =$

A. 0 B. $\frac{\pi}{4}$ C. $\frac{\pi}{2}$ D. π

119) If $f(x) = \tan\left(\frac{x^2}{2}\right)$, then $f^{-1}(\sqrt{3}) =$

A. $\sqrt{\frac{\pi}{6}}$ B. $\sqrt{\frac{\pi}{4}}$ C. $\sqrt{\frac{2\pi}{3}}$ D. π

120) Inverse function of $y = \frac{x}{x+5}$ is

A. $\frac{x}{x+5}$ B. $\frac{x}{x-5}$ C. $\frac{x}{1-x}$ D. $\frac{5x}{1-x}$

121) $f(x) = \frac{3x+1}{2x-1}$ then $f\left(f^{-1}(2)\right) =$

A. x B. $1/2$ C. 2 D. 7

122) If $h(x) = 3x + 2$ and $h\left(f(x)\right) = x$, then $f(2) = ?$

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

123) What is the value of $g(x)$ if $f(x) = \frac{2x}{3x+4}$ and $f[g(x)] = x$?

A. $\frac{2+3x}{4x}$ B. $\frac{4x}{2+3x}$ C. $\frac{4x}{2-3x}$ D. $\frac{2-3x}{4}$

124) $f: x \to \sqrt{3x^2 - 1}$ and $g: x \to \sin x$, then $(f \circ g)^{-1}: x \to$

A. $\sin^{-1}\sqrt{\frac{x^2+1}{3}}$ B. $\sqrt{\frac{1+\sin^{-1}x}{3}}$
C. $\sqrt{3\sin^2 x - 1}$ D. $\sqrt{3x^2 - 1}\sin x$

125) If f is a bijective function, then $f\left(f^{-1}(x)\right) =$

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

126) What is the range of f^{-1}, when $f(x) = 2 + \sqrt{x - 1}$?

A. $[1, \infty)$ B. $(-\infty, -1]$ C. $[-1, 1]$ D. $[2, \infty)$

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127) What is domain of f^{-1}, when $f(x) = 2 + \sqrt{x-1}$?

A. Real Number B. $[1, \infty]$ C. $[2, +\infty)$ D. $[-1, 1]$

128) If the domain of the function $f: x \to x^2 + 1$ is $\{0, 1\}$, then its range is

A. $\{0, 1\}$ B. $\{1, 2\}$ C. $\{2, 3\}$ D. $\{3, 4\}$

129) If the domain of the function $f: x \to \sqrt{3x^2 - 1}$ is $\{1, 2, \sqrt{2}, 3, \sqrt{3}\}$ then its range is

A. $\{\sqrt{11}, \sqrt{5}, \sqrt{26}\}$ B. $\{0,\ 2\sqrt{2}\}$

C. $\emptyset$ D. $\{\sqrt{2}, \sqrt{11}, \sqrt{5}, \sqrt{26},\ 2\sqrt{2}\}$

130) $\log_2[\log_2[\log_2 x]] = 1$ then $x =$?

A. 4^3 B. 3^4 C. 2^9 D. 2^2

131) $\lim_{x \to -3}(2x + 4)$

A. 10 B. 5 C. 2 D. -2

132) $\lim_{x \to 3} \sqrt{x^2 + x + 4} =$

A. 10 B. 4 C. $\sqrt{10}$ D. -2

133) $\lim_{x \to -2} \frac{2x^3 + 5x}{3x - 2} =$

A. $\frac{4}{13}$ B. $\frac{13}{4}$ C. 0 D. -2

134) $\lim_{\theta \to \frac{\pi}{2}} \tan\left(\frac{\theta}{2}\right) =$?

A. 1 B. 0 C. ∞ D. -1

135) $\lim_{h \to 0} \cos ec\,(\pi + h) =$?

A. 0 B. 1 C. -1 D. ∞

136) $\lim_{x \to 0} \frac{5x^4 + 3x^3 + 9}{7x^4 + 5x^2 + 17} =$?

A. $\frac{5}{7}$ B. $\frac{3}{5}$ C. $\frac{9}{17}$ D. 0

137) $\lim_{x \to 0} \frac{2 - 3x}{\sqrt{3 + 4x^2}} =$?

A. $\frac{2}{\sqrt{3}}$ B. $\frac{-3}{2}$ C. $\pm\frac{3}{2}$ D. None of these

138) What is the limit of the function $\lim_{x \to 5} \frac{x^2 - 25}{x - 5}$?

A. 0 B. -10 C. 25 D. 10

139) $\lim_{x \to -1} \frac{x^3 - x}{x + 1} =$

A. 5 B. 3 C. 2 D. 0

140) $\lim_{x \to 4} \frac{2x^2 - 32}{x^3 - 4x^2} =$

A. 5 B. 3 C. 2 D. 1

141) $\lim_{x \to 2} \frac{x - 2}{\sqrt{x} - \sqrt{2}} =$

A. $\sqrt{2}$ B. 2 C. $2\sqrt{2}$ D. 0

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142) $\lim_{x\to 6}\frac{x-6}{\sqrt{x}-\sqrt{6}}=$

A. $6\sqrt{2}$ B. $2\sqrt{6}$ C. $2\sqrt{3}$ D. $3\sqrt{2}$

143) $\lim_{x\to 0}\frac{\sqrt{49+x}-7}{x}=?$

A. 0 B. . $\frac{1}{14}$ C. -6 D. ∞

144) Find the value of $\lim_{x\to 1}\sqrt{\frac{1-x}{1-\sqrt{x}}}$

A. $\frac{1}{\sqrt{2}}$ B. 0 C. $\sqrt{2}$ D. ∞

145) $\lim_{x\to\infty}\frac{2-3x}{\sqrt{3+4x^2}}=$ _____.

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

146) $\lim_{x\to\infty}\frac{x+e}{x-e}$ is equal to:

A. ∞ B. 1 C. -1 D.

147) $\lim_{x\to\infty}(\sqrt{x^2+ax+a^2}-\sqrt{x^2+a^2})=$

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

148) $\lim_{x\to\infty}\frac{1}{\sqrt{x^2+ax+a^2}-\sqrt{x^2+a^2}}=$

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

149) $\lim_{x\to\infty}\frac{x^2-3x+2}{2x^3+x-3}=?$

A. 2 B. $\frac{1}{2}$ C. 0 D. does not exist

150) Let p be a + ve rational number if x^p is defined then $\lim_{x\to\infty}\frac{a}{x^p}=?$

A. 1 B. p C. 0 D. x

151) $\lim_{x\to 0}\left(\frac{e^x-1}{x}\right)=$ _____.

A. lna B. 0 C. ∞ D. 1

152) $\lim_{x\to a}\frac{x^n-a^n}{x-a}=$ _____

A. na^{n-1} B. na^n C. na^{n+1} D. None of these

153) $\lim_{x\to c}\frac{x^p-c^p}{x-c}=?$

A. 0 B. 1 C. px^{p-1} D. pc^{p-1}

154) $\lim_{x\to 0}\frac{x}{\sin x}=$

A. 0 B. 1 C. 2 D. 6

155) Evaluate $\lim_{\theta\to 0}\frac{\sin 7\theta}{\theta}$:

A. Zero B. $\frac{1}{7}$

C. 7 D. One

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156) $\lim_{x\to 0}\frac{\sin x^\circ}{x}$ is _____ .

A. 1 B. $\frac{\pi}{180}$ C. $\frac{180}{\pi}$ D. $\frac{45}{\pi}$

157) $\lim_{x\to 0}\frac{x^\circ}{\sin x^\circ} =$

A. $\frac{\pi}{180}$ B. $\frac{180}{\pi}$ C. 180π D. 1

158) $\lim_{x\to 0}\frac{\sin ax}{\sin bx} =$

A. $\frac{1}{ab}$ B. $\frac{b}{a}$ C. $\frac{a}{b}$ D. 1

159) $\lim_{x\to 0}\frac{\sin 2x}{\sin 3x} =$

A. $\frac{2}{3}$ B. $\frac{3}{2}$ C. $\frac{1}{6}$ D. 1

160) $\lim_{x\to 0}\frac{x^2}{\sin ax \sin bx} =$

A. $\frac{1}{ab}$ B. $\frac{b}{a}$ C. $\frac{a}{b}$ D. 1

161) $\lim_{x\to 0}\frac{x^2}{\sin 2x \sin 3x} =$

A. $\frac{2}{3}$ B. $\frac{3}{2}$ C. $\frac{1}{6}$ D. 1

162) $\lim_{z\to 0}\frac{\sin pz}{mz} =?$

A. 0 B. ∞ C. $\frac{1}{m}$ D. $\frac{p}{m}$

163) $\lim_{x\to 0}\frac{\tan x}{x} =$ _____

A. 0 B. -1 C. 1 D. None of these

164) $\lim_{x\to 0}\frac{\tan x^0}{x} =$

A. $\frac{\pi}{180}$ B. $\frac{180}{\pi}$ C. 180π D. 1

165) $\lim_{x\to 0}\frac{\tan 2x}{x} =$

A. 0 B. 1 C. 2 D. 6

166) $\lim_{x\to \infty}\frac{\sin x}{x} =?$

A. 0 B. undefined C. 1 D. ∞

167) $\lim_{x\to 0}\frac{(1-\cos 2x)\sin 5x}{x^2 \sin 3x} =?$

A. $\frac{10}{3}$ B. $\frac{3}{10}$ C. $\frac{6}{5}$ D. $\frac{5}{6}$

168) $\lim_{x\to 0}\frac{e^x - e^{-x}}{\sin x} =?$

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

169) $\lim_{x\to \frac{\pi}{4}}\frac{\sin x - \cos x}{x-\frac{\pi}{4}} =?$

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

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170) What result in evaluating $\lim_{x\to\infty} x.\sin\left(\frac{1}{x}\right)$

A. Undefined B. 1 C. 0 D. -1

171) $\lim_{x\to\infty} a^x \sin\left(\frac{b}{a^x}\right)$ =----------when a>1

A. a B. b C. a ln b D. b ln a

172) $\lim_{x\to\infty} 2^x \sin\left(\frac{3}{2^x}\right) =$

A. 3 B. 2 C. 3 ln 2 D. 2 ln 3

173) $\lim_{x\to 0} \frac{1-\cos 2x}{x^2} =?$

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

174) $\lim_{\theta\to 0} \frac{1-\cos p\theta}{1-\cos q\theta} =?$

A. $\frac{p^2}{q^2}$ B. $\frac{q^2}{p^2}$ C. 0 D. ∞

175) What evaluates $\lim_{x\to 0} \frac{\cos\left(\frac{3\pi}{2}-x\right)-\cos\left(\frac{3\pi}{2}\right)}{x}$?

A. $\sqrt{2}$ B. -1 C. 1 D. Limit does not exist

176) If $f(x) \le g(x) \le h(x)$ and $\lim_{x\to c} f(x) = \lim_{x\to c} h(x) = 2$, then $\lim_{x\to c} g(x) =?$

A. < 2 B. > 2 C. $= 2$ D. nothing can be say

177) $\lim_{x\to\infty}(1+\frac{1}{x})^x =$

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

178) $\lim_{n\to\infty}\left(1+\frac{1}{n}\right)^{n/2}$ is _____

A. $\sqrt[3]{e}$ B. $\sqrt{e}$ C. $\sqrt[1]{e}$ D. None of these

179) $\lim_{n\to\infty}(1+\frac{4}{n})^n =$ _____.

A. e B. e^n C. e^4 D. $e^{\frac{1}{4}}$

180) $\lim_{n\to+\infty}[1+\frac{1}{n}]^{2n} = ?$

A. zero B. e^{2n} C. e^2 D. e^n

181) $\lim_{x\to\infty}\left(\frac{x}{1+x}\right)^x =?$

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

182) $\lim_{x\to\infty}\left(\frac{x}{x+2}\right)^x =?$

A. e B. e^{-1} C. $\frac{1}{\sqrt{e}}$ D. e^5

183) $\lim_{n\to\infty}(1-\frac{1}{n})^n =$ _____

A. e^{-1} B. e C. $-e$ D. None of these

184) $\lim_{x\to 0}(x+1)^{\frac{1}{x}}$ is?

A. 1 B. e C. ∞ D. 0

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185) $\lim_{x\to 0}(1+x)^{\frac{1}{x}} = ?$

A. e^x B. ∞ C. $e^{\frac{1}{x}}$ D. e

186) $\lim_{x\to 0}(1-4x)^{\frac{1}{x}} = ?$

A. e^4 B. $\frac{1}{e^4}$ C. e D. e^{-4x}

187) Which one is true?

(I) $\lim_{x\to\infty} e^x = \infty$ (II) $\lim_{x\to\infty} e^x = 0$ (III) $\lim_{x\to\infty} a^x = a$

A. I & *II only* B. II and III only C. I only D. all

188) $\lim_{x\to-\infty}(e^x) =$ _____

A. ∞ B. $-\infty$ C. 0 D. 1

189) $\lim_{x\to 0} e^{\frac{-1}{x^4}} = ?$

A. ∞ B. 0 C. -1 D. 1

190) $\lim_{x\to-\infty} 2^x$ is equal to:

A. 1 B. 0 C ∞ D. $-\infty$

191) $\lim_{x\to 0} \frac{e^{\frac{-1}{x^2}}}{1+e^{\frac{-1}{x^2}}} = ?$

A. 0 B. 1 C. -1 D. ∞

192) For a function if right hand limit = left hand limit then which of the following must be true

A. Function is continuous B. its limit exists

C. Function is defined D. None of these

193) What is the evaluated value of $\lim_{h\to 0} \frac{|h|}{h}$?

A. ± 1 B. 1 C. 0 D. Limit does not exist

194) _____is the value of the $\lim_{x\to-\infty} \frac{|x|}{x}$

A. -1 B. 1 C. 0 D. ∞

195) If $f(x) = \begin{cases} 4-2x, & x<1 \\ 6x-4, & x\geq 1 \end{cases}$ then what result comes in evaluting $\lim_{x\to 1^-} f(x)$?

A. -2 B. -1 C. 1 D. 2

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