MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

FUNCTIONS

Others

1. If $f(x) = \frac{\cos^2 x + \sin^4 x}{\sin^2 x + \cos^4 x}$, for $x \in R$, then f(2002) is equal to

Watch Video Solution

2. The range of the function $f(x) = \frac{x^2 - x}{x^2 + 2x}$ is R (b) $R - [1]$ (c) $R = \left\{ -\frac{1}{2}, 1 \right\}$ (d) none of these

Watch Video Solution

3. If $f(x) = \cos(\log x)$, then value of $f(x)f(4) - \frac{1}{2}\left\{f\left(\frac{x}{4}\right) + f(4x)\right\}$ is (a) 1 (b) -1 (c) 0 (d) ± 1

Watch Video Solution

4. If $f(x) = \log\left(\frac{1+x}{1-x}\right) and then f\left(\frac{2x}{1+x^2}\right)$ is equal to $\{f(x)\}^2$ (b) $\{f(x)\}^3$ (c) $2f(x)$ (d) $3f(x)$

Watch Video Solution

5. If $2f(x) - 3f\left(\frac{1}{x}\right) = x^2 (x \neq 0)$, then $f(2)$ is equal to (a)$-\frac{7}{4}$(b)$\frac{5}{2}$ (c) -1 (d) none of these

Watch Video Solution

6. If $f(x) = \frac{2^x + 2^{-x}}{2}$, then $f(x+y)f(x-y)$ is equals to (a) $\frac{1}{2}\{f(2x) + f(2y)\}$ (b) $\frac{1}{2}\{f(2x) - f(2y)\}$ (c) $\frac{1}{4}\{f(2x) + f(2y)\}$

$\frac{1}{4}\{f(2x) - f(2y)\}$

Watch Video Solution

7. Let $f(x) = \frac{\alpha x}{x+1}, x \neq -1$. Then write the value of α satisfying $f(f(x)) = x$ for all $x \neq -1$.

Watch Video Solution

8. Write the range of the function $f(x) = \sin[x], where \frac{-\pi}{4} \leq x \leq \frac{\pi}{4}$.

Watch Video Solution

9. If $f(x) = \log\left(\frac{1+x}{1-x}\right) and g(x) = \left(\frac{3x + x^3}{1 + 3x^2}\right)$, then $f(g(x))$ is equal to (a) $f(3x)$ (b) $\{f(x)\}^3$ (c) $3f(x)$ (d) $-f(x)$

Watch Video Solution

10. If $f(x) = \cos(\log x)$ then $f(x)f(y) - \frac{1}{2}\left[f\left(\frac{x}{y}\right) + f(xy)\right]$ has the value

Watch Video Solution

11. Relation between graphs of a function and its inverse.

Watch Video Solution

12. A be the set of two positive integers and $f: A \to Z^+$ (set of positive integer) defined as $f(n) = p$ where p is the largest prime factor of n. If the range of f is $\{3\}$, find A.

Watch Video Solution

13. Range of $f(x) = \frac{1}{1 - 2\cos x}$ is uu[1/3,oo)(4)[-1/3,1]`

A. $\left[\frac{1}{3}, 1\right]$

B. $\left[-1, \frac{1}{3}\right]$

C. $(-\infty, -1] \cup \left[\frac{1}{3}, \infty\right)$

D. $\left[-\frac{1}{3}, 1\right]$

Answer: C

Watch Video Solution

14. Let $f: [2, \infty) \to R$ and $g: [-2, \infty) \to R$ be to two real functions defined $f(x) = \sqrt{x-2} and g(x) = \sqrt{x+2.}$ Find $f+g$ and $f-g$.

Watch Video Solution

15. Find the domain of each of the following real valued functions of real variable: $f(x) = \sqrt{x-2}$ (ii) $f(x) = \frac{1}{\sqrt{x^2-1}}$ (iii) $f(x) = \sqrt{9-x^2}$ (iv) $f(x) = \sqrt{\frac{x-2}{3-x}}$

Watch Video Solution

16. Examples :- If $x; y \in \{1; 2; 3; 4\}$;then which of the following are function in the given set ? (a) f_1={(x;y):y=(x+1)} (b) f_2={(x;y):y4 (d) f_4= {(x;y):x+y=5}`

Watch Video Solution

17. Find the domain and range of the function $f = \left\{\left(x : \frac{1}{1-x^2}\right) : x \in R, x \neq \pm 1\right\}$.

Watch Video Solution

18. Express the following functions as sets of ordered pairs and determine their ranges $f : A \to R, f(x) = x^2 + 1$ where $A = \{-1, 0, 2, 4\}$. $g : A \to N, g(x) = 2x$ where $A = \{x : x \in N, x \leq 10\}$.

Watch Video Solution

19. Given $A = \{-1, 0, 2, 5, 6, 11\}, B = \{-2, -1, 0, 18, 28, 108\}$ and $f(x) = x^2 - x - 2$. *Is* $f(A) = B$? Find $f(A)$.

Watch Video Solution

20. if for nonzero x, $af(x) + bf\left(\frac{1}{x}\right) = \frac{1}{x} - 5$, where $a \neq b$ then f(2) =

Watch Video Solution

21. If $f(x) = (a - x^n)^{\frac{1}{n}}, a > 0$ and $n \in N$, then prove that $f(f(x)) = x$ for all x.

Watch Video Solution

22. If $f(x) = \frac{x-1}{x+1}$, then show that $f\left(\frac{1}{x}\right) = -f(x)$ (ii) $f\left(-\frac{1}{x}\right) = -\frac{1}{f(x)}$

Watch Video Solution

23. Find the domain and range of the function $f(x)$ given by $f(x) = \frac{x-2}{3-x}$.

Watch Video Solution

24. Find range of each of the following functions: 1. y=3sinx-2 2. y=2cosx+5

Watch Video Solution

25. Is $g = \{(1,1),(2,3),(3,5),(4,7)\}$ a function? If this is described by the formula, $g(x) = \alpha x + \beta$, then what values should be assigned to α and β?

Watch Video Solution

26. Let $f: R \to R$ be such that $f(x) = 2^x$. Determine: Range of f (ii) $\{x: f(x) = 1\}$ (iii) Whether $f(x + y) = f(x) f(y)$ holds.

Watch Video Solution

27. Let $f: R \to R$ be given by $f(x) = x^2 + 3$. Find (i) $\{x: f(x) = 28\}$ (ii) the pre-images of 39 and 2 under f.

Watch Video Solution

28. Find the domain and range of the function $f(x) = \frac{1}{2 - \sin 3x}$.

Watch Video Solution

29. If $[x]^2 - 5[x] + 6 = 0,$ where [.] denotes the greatest integer function, then $x \in [3, 4]$ (b) $x \in (2, 3]$ (c) $x \in [2, 3]$ (d) $x \in [2, 4)$

Watch Video Solution

30. If f is a real valued function given by $f(x) = 27x^3 + \frac{1}{x^3} and \alpha, \beta$ are roots of $3x + \frac{1}{x} = 2$. Then, $f(\alpha) = f(\beta) = -9$ (b) $f(\alpha) = 10$ (c) $f(\beta) = -10$ (d) none of these

Watch Video Solution

31. If $3f(x) + 5f\left(\frac{1}{x}\right) = \frac{1}{x} - 3$ for all non-zero x , then $f(x) =$ (a) $\frac{1}{16}\left(\frac{3}{x} + 5x - 6\right)$ (b) $\frac{1}{16}\left(-\frac{3}{x} + 5x - 6\right)$ (c) $\frac{1}{16}\left(-\frac{3}{x} + 5x + 6\right)$ (d) none of these

Watch Video Solution

32. The function $f: R \Rightarrow R$ is defined by $f(x) = \cos^2 x + \sin^4 x, rangeof f(x) =$ (a)$[3/4, 1)$ (b) $(3/4, 1]$ (c) $[3/4, 1]$ (d) $(3/4, 1)$

Watch Video Solution

33. If $e^{f(x)} = \frac{10+x}{10-x}, x \in (-10, 10) and f(x) = kf\left(\frac{200x}{100+x^2}\right), then$ $k =$ (a) 0.5 (b) 0. 6 (c) 0.7 (d) 0.8

Watch Video Solution

34. The domain of definition of $f(x) = \sqrt{\frac{x+3}{(2-x)(x-5)}}$ is (a) $(-\infty, -3] \cup (2, 5)$ (b) $(-\infty, -3) \cup (2, 5)$ (c) $(-\infty, -3] \cup [2, 5]$ (d) none of these

Watch Video Solution

35. The range of the function $f(x) = \sqrt{5|x| - x^2 - 6}$ is equals to (a.) $(-3, -2) \cup (2, 3)$ (b.) $[-3, -2) \cup [2, 3)$ (c.) $[-3, -2] \cup [2, 3]$ (d.) none of these

Watch Video Solution

36. If $f: R \to R$ be given by $f(x) = \frac{4^x}{4^x + 2}$ for all $x \in R$. Then, (a) $f(x) = f(1 - x)$ (b) $f(x) + f(1 - x) = 0$ (c) $f(x) + f(1 - x) = 1$ (d) $f(x) + f(x - 1) = 1$

Watch Video Solution

37. If $f(x) = \sin\left[\pi^2\right]x + \sin\left[-\pi^2\right]x$, where $[x]$ denotes the greatest integer less than or equal to

A. $f(\pi/2) = 1$

B. $f(\pi) = 2$

C. $f(\pi/4) = -1$

D. none of these

Watch Video Solution

38. If f is a real function defined by $f(x) = \frac{x - 1}{x + 1}$, then prove that $f(2x) = \frac{3f(x) + 1}{f(x) + 3}$

Watch Video Solution

Watch Video Solution

39. If $y = f(x) = \frac{ax - b}{bx - a}$, show that $x = f(y)$.

Watch Video Solution

40. If $f(x) = \frac{x-1}{x+1}, x \neq -1,$. then show that $f(f(x)) = -\frac{1}{x}$, prove that $x \neq 0$.

Watch Video Solution

41. t f be defined by $f(x) = x - 4$ and g be defined by $g(x) = \begin{cases} \frac{x^2-16}{x+4}, x \neq -4 \\ \frac{x^2-16}{x+4}, x \neq -4\lambda, x = -4 \end{cases}$. Find λ such that $f(x) = g(x)$ for all x.

Watch Video Solution

42. Express the function $f: X \to R$ given by $f(x) = x^3 + 1$ as set of ordered pairs, where $X = \{-1, 0, 3, 9, 7\}$.

Watch Video Solution

43. If $f(x) = x + \frac{1}{x}$, prove that $[f(x)]^3 = f(x^3) + 3f\left(\frac{1}{x}\right)$..

Watch Video Solution

44. Let $f: R \overrightarrow{R} and g: C \overrightarrow{C}$ be two functions defined as $f(x) = x^2 and g(x) = x^2$. Are they equal functions?

Watch Video Solution

45. Let $A = \{12, 13, 14, 15, 16, 17\} and f: A \to Z$ be function given by $f(x) =$ highest prime factor of x. Find range of f.

Watch Video Solution

46. Find the domain of each of the following functions given by $f(x)=\frac{1}{\sqrt{x-|x|}}$ (ii) $f(x)=\frac{1}{\sqrt{x+|x|}}$ (iii) $f(x)=\frac{1}{\sqrt{x-[x]}}$ (iv) $f(x)=\frac{1}{\sqrt{x+[x]}}$

Watch Video Solution

47. Find the domain of definition of the following $f(x)$ given by $f(x)=\log_4\{(\log_5\log_3(18x-x^2-77)\}$

Watch Video Solution

48. Find the domain of definition of the function $f(x)$ given by $f(x)=\frac{1}{\log_{10}(1-x)}+\sqrt{x+2}$.

Watch Video Solution

49. Find the range of each of the following functions: $f(x) = |x - 3|$

$f(x) = 1 - |x - 2|$ $f(x) = \dfrac{|x - 4|}{x - 4}$

Watch Video Solution

50. Find the sum and product of identity function and the modulus function.

Watch Video Solution

51. Let $cbea$ non-zero real number and $f: R\overrightarrow{R}$ be a function defined by $f(x) = \dfrac{x}{c}$ for all $x \in R$. Find (i) cf (ii) $c^2 f$ (iii) $\left(\dfrac{1}{c}\right) f$.

Watch Video Solution

52. If $f(x) = \dfrac{1}{1 - x}$, show that $f[f\{f(x)\}] = x$.

Watch Video Solution

53. If $f(x) = x^3 - \frac{1}{x^3}$, show that $f(x) + f\left(\frac{1}{x}\right) = 0$.

Watch Video Solution

54. Let $f and g$ be two real functions defined by $f(x) = \frac{1}{x+4} and g(x) = (x-4)^3$. Find the following: $f+g$ (ii) $f-g$ (iii) fg (iv) $\frac{f}{g}$ (v) $2f$ (vi) $\frac{1}{f}$ (vii) $\frac{1}{g}$

Watch Video Solution

55. Find the range of each of the following functions: $f(x) = \frac{1}{\sqrt{x-5}}$ (ii) $f(x) = \sqrt{6-x^2}$ (iii) $f(x) = \frac{x}{1-x^2}$ (iv) $f(x) = \frac{3}{2-x^2}$

Watch Video Solution

56. Find the domain of the real function $f(x)$ defined by $f(x) = \sqrt{\frac{1-|x|}{2-|x|}}$.

Watch Video Solution

57. Let f be the exponential function and g be the logarithmic function,

Find: (i) $(f+g)(1)$ (ii) $(fg)(1)$ (iii) $(3f)(1)$ (iv) $(5g)(1)$

Watch Video Solution

58. If f is a real function satisfying $f\left(x+\frac{1}{x}\right) = x^2 + \frac{1}{x^2}$ for all $x \in R - \{0\}$, then write the expression for $f(x)$.

Watch Video Solution

59. Let f be a relation on the set $\mathbb{N}$ of natural numbers defined by $f = \{(n, 3n) : n \in \mathbb{N}\}$ is f a function from $\mathbb{N} \to \mathbb{N}$. If so, find the range

of f.

Watch Video Solution

60. Let f be the subset of $Z \times Z$ defined by $f = \{(ab, a + b) : a, b \in Z\}$. Is f a function from Z to Z? Justify your answer.

Watch Video Solution

61. Consider a rule $f(x) = 2x - 3$ associating elements of $\mathbb{N}$ (set of natural numbers) to elements of $\mathbb{N}$. Is it a function?

Watch Video Solution

62. Let $A = \{-2, -1, 0, 1, 2\} and\ f: A \to \mathbb{Z}$ be given y $f(x) = x^2 - 2x - 3$. Find: i. the range of f ii. pre images of 6,-3 and 5.

Watch Video Solution

63. Let $A = \{1, 2\}$, $B = \{3, 6\}$ and $f: A \to B$ given by $f(x) = x^2 + 2$ and $g: A \to B$ given by $g(x) = 3x$. Verify $f = g$.

Watch Video Solution

64. Let $f: R - \{2\} \to R$ be defined as f(x) = $\frac{x^2 - 4}{x - 2}$ and $g: R \to R$ be defined by g(x) = x + 2. Find whether f = g or not.

Watch Video Solution

65. Let $f: \mathbb{Z} \to \mathbb{Z}$ *and* $g: \mathbb{Z} \to \mathbb{Z}$ be functions defined by $f = \{(n, n^2) : n \in \mathbb{Z}\}$ and $g = \left\{\left(n, |n|^2\right) : n \in \mathbb{Z}\right\}$. Show that. $f = g$.

Watch Video Solution

66. Let $f: R \to R$ be a function given by $f(x) = x^2 + 1$. Find: $f^{-1}\{-5\}$

Watch Video Solution

67. Let $f: R \to R$ be a function given by $f(x) = x^2 + 1$. Find: $f^{-1}\{26\}$

Watch Video Solution

68. Let $f: R \to R$ be a function given by $f(x) = x^2 + 1$. Find: $f^{-1}\{10, 37\}$

Watch Video Solution

69. Let $f = \{(1, 1), (2, 3), (0, -1), (-1, -3)\}$ be a function from Z to Z defined by $f(x) = ax + b$, for some integers a, b. Determine a, b.

Watch Video Solution

70. If $f: \mathbb{R} \to \mathbb{R}$ be defined as follows:

$f(x) = \{1, \quad \text{if} \quad x \in \mathbb{Q}, \ -1, \quad \text{if} \quad x \notin \mathbb{Q}$ Find: $f(1/2), f(\pi), \ f\left(\sqrt{2}\right)$

Watch Video Solution

71. If $f: R \to R$ be defined as follows:

$f(x) = \{1, \quad \text{if} \quad x \in Q - 1, \quad \text{if} \quad x \notin Q$ Find: range of f.

Watch Video Solution

72. Define a function as a set of ordered pairs.

Watch Video Solution

73. Define a function as a correspondence between two sets.

Watch Video Solution

Watch Video Solution

74. Let $A = \{-2, -1, 0, 1, 2\} and\ f: A \to Z$ be given y $f(x) = x^2 - 2x - 3$. Find: i. the range of f ii. pre images of 6,-3 and 5.

Watch Video Solution

75. Let $A = \{-2, -1, 0, 1, 2\} and\ f: A \to Z$ be given y $f(x) = x^2 - 2x - 3$. Find: i. the range of f ii. pre images of 6,-3 and 5.

Watch Video Solution

76. If a function $f: R \to R$ be defined by $f(x) = \{3x - 2,\ x < 01, x = 04x + 1, x > 0$ Find: $f(1),\ f(-1),\ f(0),\ f(2)$.

Watch Video Solution

77. A function $f: R \to R$ is defined by $f(x) = x^2$. Determine Range of f

ii. $\{x: f(x) = 4\}$ iii. $\{y: f(y) = -1\}$

Watch Video Solution

78. Let $f: R^+ \to R$ where R^+ is the set of all positive real numbers, be such that $f(x) = (\log)_e x$. Determine: the image set of the domain of f

Watch Video Solution

79. Let $f: R \to R$ whre R^+ is the set of all positive real numbers, be such that $f(x) = (\log)_e x$. Determine: $\{x: f(x) = -2\}$

Watch Video Solution

80. Let $f: R \to R$ whre R^+ is the set of all positive real numbers, be such that $f(x) = (\log)_e x$. Determine: whether $f(xy) = f(x) + f(y)$

holds.

Watch Video Solution

81. Write the following relations as sets of ordered pairs and find which of them are function : $\{(x, y) : y = 3x,\ x \in \{1, 2, 3\},\ y \in \{3, 6, 9, 12\}\}$.

Watch Video Solution

82. Write the following relations as sets of ordered pairs and find which of them are function : $\{(x, y) : y > x + 1, x = 1, 2\ and\ y = 2, 4, 6\}$

Watch Video Solution

83. Write the following relations as sets of ordered pairs and find which of them are function : $\{(x, y) : x + y = 3, x, y \in \{0, 1, 2, 3\}\}$

Watch Video Solution

84. If f, g, h are three functions defined from $R \to R$ as follows: Find the range of $f(x) = x^2$

Watch Video Solution

85. If f, g, h are three functions defined from $R \to R$ as follows: the range of $h(x) = x2 + 1$

Watch Video Solution

86. If f, g, h are three functions defined from $R \to R$ as follows: the range of $h(x) = x^2 + 1$

Watch Video Solution

87. Let $X = \{1, 2, 3, 4\} and\, Y = \{1, 5, 9, 11, 15, 16\}$ Determine which of the following sets are functions from $X \to Y$

$f_1 = \{(1, 1), (2, 11), (3, 1), (4, 15)\}$

Watch Video Solution

88. Let $X = \{1, 2, 3, 4\} and\, Y = \{1, 5, 9, 11, 15, 16\}$ Determine which of the following sets are functions from $X \to Y$

$f_2 = \{(1, 1), (2, 7), (3, 5)\}$ and

$f_3 = \{(1, 5), (2, 9), (3, 1), (4, 5), (2, 11)\}$

Watch Video Solution

89. Let $A = \{1, 2, 3, 4\}, B = \{1, 5, 9, 11, 15, 16\}$and $f = \{(1, 5), (2, 9), (3, 1), (4, 5), (2, 11)\}$. Are the following true?(i) f is a relation from A to B(ii) f is a function from A to B.Justify y

Watch Video Solution

90. If $f: R \to R$ be defined by $f(x) = x^2 + 1$, then find $f^{-1}(17)$ and $f^{-1}(-3)$.

Watch Video Solution

91. If $A = \{p, q, r, s\}$ and $B = \{1, 2, 3\}$, find which of the following is not a function from A to B?

A. (p,1) (q,2) (r,1) (s,2)

B. (p,1) (q,1) (r,1) (s,1)

C. (p,1) (q,2) (p,2) (s,3)

D. (p,2) (q,3) (r,2) (s,2)

Answer: null

Watch Video Solution

92. If $A = \{p, q, r, s\}$ and $B = \{1, 2, 3\}$, find which of the following is not a function from A to B R 1={(p,1),(q,2),(r,1),(s,2)}

A. R 1 ={(p,1),(p,2),(r,1),(s,2)}

B. null

C. null

D. null

Answer: null

Watch Video Solution

93. If $A = \{p, q, r, s\}$ and $B = \{1, 2, 3\}$, find which of the following is not a function from A to B? i. R 1 ={(p,1),(p,2),(r,1),(s,2)} ii.R 2 ={(p,1),(q,2),(r,2),(r,3)}

Watch Video Solution

94. If $A = \{p, q, r, s\}$ and $B = \{1, 2, 3\}$, find which of the following is not a function from A to B? (i) R1={(p,1),(q,2),(r,1),(s,2)} (ii) R2={(p,1),(q,1),(r,1),(s,1)}

Watch Video Solution

95. Let $A = \{9, 10, 11, 12, 13\}$and let $f: A \to N$be defined by f(n) = the highest prime factor of n. Find the range of f.

Watch Video Solution

96. The relation f is defined by $f(x) = \{x^2, 0 \leq x \leq 33x, 3 \leq x \leq 10$ The relating g is defined by $g(x) = \{x^2, 0 \leq x \leq 33x, 2 \leq x \leq 10$Show that f is a function and g is not a function.

Watch Video Solution

97. If $f(x) = x^2$, find $\frac{f(1.1) - f(1)}{(1.1 - 1)}$

Watch Video Solution

98. If $f(x) = 3x^4 - 5x^2 + 9$, find $f(x - 1)$.

Watch Video Solution

99. If $f(x) = \frac{1}{2x + 1}$, $x \neq -\frac{1}{2}$, then show that $f(f(x)) = \frac{2x + 1}{2x + 3}$, provided that $x \neq -\frac{3}{2}$.

Watch Video Solution

100. If $f(x) = x^2 - 3x + 4$, then find the values of x satisfying the equation $f(x) = f(2x + 1)$.

Watch Video Solution

101. If $f(x) = (x-a)^2(x-b)^2$, find $f(a+b)$

Watch Video Solution

102. If $f(x) = \dfrac{x+1}{x-1}$, show that $f\{f(x)\} = x$.

Watch Video Solution

103. If $f(x) = \begin{cases} x^2 & \text{when} \quad x < 0 \\ x & \text{when} \quad 0 \le x < 1 \\ \frac{1}{x} & \text{when} \quad x > 1 \end{cases}$ $Find : (i).\ f(1/2)\ (ii).\ f(-2)\ (iii).\ f(1)\ (iv).\ f\left(\sqrt{3}\right)\ (v).\ f\left(-\sqrt{3}\right)$

A. i. $f(1/2)$

B. ii. $f(-2)$

C. null

D. null

Answer: null

Watch Video Solution

104. If $f(x) = \frac{2x}{1+x^2}$, show that $f(\tan\theta) = \sin 2\theta)$

Watch Video Solution

105. Find the domain of each of the following real valued function:

$f(x) = \frac{1}{x+2}$

Watch Video Solution

106. Find the domain of each of the following real valued function:

$f(x) = \frac{x-1}{x-3}$

Watch Video Solution

107. Find the domain of each of the following real valued function:

$$f(x) = \frac{2x - 3}{x^2 - 3x + 2}$$

Watch Video Solution

108. Find the domain of each of the following real valued function:

$$f(x) = \frac{x^2 + 3x + 5}{x^2 - 5x + 4}$$

Watch Video Solution

109. Find the domain of the function $f(x)$ defined by

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

Watch Video Solution

110. The range of the function $f(x) = \frac{x^2 - 9}{x - 3}; x \neq 3$ is

Watch Video Solution

111. The domain and range of the real function f defined by $f(x) = \frac{4-x}{x-4}$ is

Watch Video Solution

112. The range of the function $f(x) = |x-1|$ is

A. $(-\infty, 0)$

B. $[0, \infty)$

C. $(0, \infty)$

D. R

Watch Video Solution

113. Let $f = \left\{\left(x, \frac{x^2}{1+x^2}\right) : x \in R\right\}$ be a function from R into R. Determine the rage of f.

Watch Video Solution

114. Find the domain of each of the following real valued functions of real variable: $f(x) = \frac{1}{x}$

Watch Video Solution

115. Find the domain of each of the following real valued functions of real variable: $f(x) = \frac{1}{x-7}$

Watch Video Solution

116. Find the domain of each of the following real valued functions of real variable: $f(x) = \frac{3x-2}{x+1}$

Watch Video Solution

117. Find the domain of each of the following real valued functions of real variable: $f(x) = \frac{2x+1}{x^2-9}$

Watch Video Solution

118. Find the domain of the function $f(x) = \frac{x^2 + 2x + 1}{x^2 - 8x + 12}$

Watch Video Solution

119. Find the domain and range of each of the following real valued function: $f(x) = \frac{ax + b}{bx - a}$.

Watch Video Solution

120. Find the domain and range of each of the following real valued function: $f(x) = \frac{ax - b}{cx - d}$.

Watch Video Solution

121. Find the domain and the range of the real function f defined by $f(x) = \sqrt{(x-1)}$.

Watch Video Solution

122. Find the domain and range of each of the following real valued function: $f(x) = \sqrt{x-3}$.

Watch Video Solution

123. Find the domain and the range of the real function/defined by $f(x) = |x-1|$

Watch Video Solution

124. Find the domain and range of each of the following real valued function: $f(x) = \frac{x-2}{2-x}$.

Watch Video Solution

125. Find the domain and range of the following real functions:(i) $f(x) = -|x|$ (ii) $f(x) = \sqrt{9 - x^2}$

Watch Video Solution

126. Find the domain and range of the following real functions:(i) $f(x) = -|x|$ (ii) $f(x) = \sqrt{9 - x^2}$

Watch Video Solution

127. Find the sum and difference of the identity function and the modulus function.

Watch Video Solution

128. What are the sum and difference of the identity function and the reciprocal function ?

Watch Video Solution

129. Find the quotient of the identity function by the modulus function.

Watch Video Solution

130. Find the product of the identity function and the reciprocal function.

Watch Video Solution

131. Find the quotient of the identity function by the reciprocal function.

Watch Video Solution

132. Let $f\ and\ g$ be real functions define by $f(x) = x + 2$ and $g(x) = 4 - x^2$. Then, find each of the following function: $f + g$

Watch Video Solution

133. Let $f\ and\ g$ be real functions define by $f(x) = x + 2$ and $g(x) = 4 - x^2$. Then, find each of the following function: $f - g$

Watch Video Solution

134. Let $f\ and\ g$ be real functions define by $f(x) = x + 2$ and $g(x) = 4 - x^2$. Then, find each of the following function: $\frac{f}{g}$

Watch Video Solution

135. Let $f\ and\ g$ be real functions define by $f(x) = x + 2$ and $g(x) = 4 - x^2$. Then, find each of the following function: fg

Watch Video Solution

136. Find the domain and range of each of the following functions given by $f(x) = \frac{1}{x - [x]}$

Watch Video Solution

137. Find the domain and range of each of the following functions given by $f(x) = 1 - |x - 3|$

Watch Video Solution

138. Find the domain and range of the function given by $f(x) = \frac{1}{\sqrt{x - [x]}}$

Watch Video Solution

139. Find the domain and range of each of the following functions given by $f(x) = 1 - |x - 3|$

Watch Video Solution

140. Find the domain of the function f given by $f(x) = \frac{1}{\sqrt{[x]^2 - [x] - 6}}$

Watch Video Solution

141. Find the $f + g,\ f - g,\ cf(c \in R,\ c \neq 0),\ fg,\ \frac{1}{f} and \frac{f}{g}$ in each of the following: $f(x) = \sqrt{x - 1} and\ g(x) = \sqrt{x + 1}$

Watch Video Solution

142. Let $f(x) = 2x$ +5 and $g(x) = x^2 + x\cdot$ Describe i. $f + g$ ii. $f - g$ iii. fg iv. f / g . Find the domain in each case.

Watch Video Solution

143. Let f, g be two real functions defined by $f(x) = \sqrt{x+1} and\, g(x) = \sqrt{9-x^2}$. Then describe each of the following function: $f + g$

Watch Video Solution

144. Let f, g be two real functions defined by $f(x) = \sqrt{x+1} and\, g(x) = \sqrt{9-x^2}$. Then describe each of the following function: $g - f$

Watch Video Solution

145. Let f, g be two real functions defined by $f(x) = \sqrt{x+1} and\, g(x) = \sqrt{9-x^2}$. Then describe each of the following function: $f\, g$

Watch Video Solution

146. Let f, g be two real functions defined by $f(x) = \sqrt{x+1}\, and\, g(x) = \sqrt{9-x^2}$. Then describe each of the following function: f/g

Watch Video Solution

147. Let f, g be two real functions defined by $f(x) = \sqrt{x+1}\, and\, g(x) = \sqrt{9-x^2}$. Then describe each of the following function: $\frac{g}{f}$

Watch Video Solution

148. Let f, g be two real functions defined by $f(x) = \sqrt{x+1}\, and\, g(x) = \sqrt{9-x^2}$. Then describe each of the following function: $2f - \sqrt{5}g$

Watch Video Solution

149. Let f, g be two real functions defined by $f(x) = \sqrt{x+1}\, and\, g(x) = \sqrt{9-x^2}$. Then describe each of the following function: $f^2 + 7f$

Watch Video Solution

150. Let f, g be two real functions defined by $f(x) = \sqrt{x+1}\, and\, g(x) = \sqrt{9-x^2}$. Then describe each of the following function: $\frac{5}{g}$

Watch Video Solution

151. If $f(x) = (\log)_e(1-x) and\, g(x) = [x]$, then determine each of the following function : $f + g$

Watch Video Solution

152. If $f(x) = (\log)_e(1-x) and\ g(x) = [x]$, then determine each of the following function : fg

Watch Video Solution

153. If $f(x) = (\log)_e(1-x) and\ g(x) = [x]$, then determine each of the following function : $\frac{f}{g}$

Watch Video Solution

154. If $f(x) = (\log)_e(1-x) and\ g(x) = [x]$, then determine each of the following function : $\frac{g}{f}$

Watch Video Solution

155. f and g are two real valued functioned. f=ln(1-x) and g=[x] .Find $(f+g)(-1),\ (fg)(0),\ \left(\frac{f}{g}\right)\left(\frac{1}{2}\right),\ \left(\frac{g}{f}\right)\left(\frac{1}{2}\right)$.

Watch Video Solution

156. If f, g, h are real functions defined by $f = \sqrt{x+1}, g(x) = \frac{1}{x}$ and $h(x) = 2x^2 - 3$, then find the values of $(2fg + g - h)(1)$ and $(2f + g - h)(1)$.

Watch Video Solution

157. Let f, g : R $\rightarrow$ R be defined, respectively by $f(x) = x + 1$, $g(x) = 2x + 3$. Find $f + g$, $f - g$ and $\frac{f}{g}$.

Watch Video Solution

158. Le $f: [0, \infty) \rightarrow R$ and $g: R \rightarrow R$ be defined by $f(x) = \sqrt{x}$ and $g(x) = x$. Find $f + g$, $f - g$, fg and $\frac{f}{g}$.

Watch Video Solution

159. Let $f(x) = x^2$ and $g(x) = 2x + 1$ be two real functions. Find $(f + g)(x), (f - g)(x), (fg)(x), \left(\frac{f}{g}\right)(x)$.

Watch Video Solution

160. Write the range of the real function $f(x) = |x|$.

Watch Video Solution

161. If $f(x) = \cos[\pi]^2 x + \cos[-\pi^2]x$, *where* $[x]$ denotes the greatest integer less than or equal to x, then write the value of $f(\pi)$.

Watch Video Solution

162. Writhe the range of the function `f(x)=cos[x],\ w h e r e -\ pi/2

Watch Video Solution

163. Write the range of the function $f(x) = e^{x - [x]},\ x \in R$.

Watch Video Solution

164. If $f(x) = 1 - \frac{1}{x}$ then write the value of $f\left(f\left(\frac{1}{x}\right)\right)$.

Watch Video Solution

165. Write the domain and range of the function $f(x) = \frac{x - 2}{2 - x}$.

Watch Video Solution

166. If $f(x) = 4x - x^2, x \in R,$ then write the value of $f(a + 1) - f(a - 1)$.

Watch Video Solution

167. If f, g, h are real functions given by $f(x) = x^2, g(x) = \tan x \; and \; h(x) = \log, x, \; then$ write the value of $(hog \; of)\left(\sqrt{\frac{\pi}{4}}\right)$.

Watch Video Solution

168. Write the domain and range of function $f(x)$ given by $f(x) = \frac{1}{\sqrt{x - [x]}}$

Watch Video Solution

169. Write of the domain and range of $f(x) = \sqrt{x - [x]}$.

Watch Video Solution

170. Write the domain and range of function $f(x)$ given by $f(x) = \sqrt{[x] - x}$.

Watch Video Solution

171. Let A and B be any two sets such that n(B)=P, n(A)=q then the total number of functions f:$A \to B$ is equal to

Watch Video Solution

172. Let f a n d g be two functions given by f={(2,4), (5,6), (8,-1), (10 ,-3)} a n d g={(2,5), (7,1),(8,4),(10 , 13),(11,-5)}. Find the Domain of f + g

Watch Video Solution

173. Find the values of x for which the functions $f(x) = 3x^2 - 1$ and $g(x) = 3 + x$ are equal

Watch Video Solution

174. Let $f \, and \, g$ be two real function given by $f = \{(0, 1), \ (2, 0), \ (3, \ -4), \ (4, 2), \ (5, 1) and \ g = \{(1, 0), \ (2, 2), \ (3, \ -$

Find the domain of fg.

Watch Video Solution

175. Let $A = [1, 2, 3], \ B = [2, 3, 4],$ then which of the following is a function from $A \ \rightarrow \ B$? a.$[(1, 2), \ (1, 3), (2, 3), (3, 3)]$ b. $\{(1, 3), (2, 4)\}$ c. $\{(1, 3), (2, 2), (3, 3)\}$ d. $\{(1, 2), (2, 3), (3, 2), (3, 4)\}$

Watch Video Solution

176. If $f : Q \rightarrow Q$ is defined as $f(x) = x^2, \ then \ f^{-1}(9)$ is equal to a.3 b. -3 c. φ d. $\{-3, 3\}$

Watch Video Solution

177. Which one of the following is not a function?

$\{(x, y) : x, y \in R, x^2 = y\}$ b. $\{(x, y) : x, y \in R, y^2 = x\}$ c. $\{(x, y) : x, y \in R, x = y^3\}$ d. $\{(x, y) : x, y \in R, y = x^3\}$

Watch Video Solution

178. If $f(x) = \cos\left((\log)_e x\right), then f(x)f(y) - \frac{1}{2}\left[f\left(\frac{x}{y}\right) + f(xy)\right]$ has value (a) -1 (b) $\frac{1}{2}$ (c) -2 (d) none of these

Watch Video Solution

179. Let $f(x) = |x - 1|$. Then (a) $f(x^2) = (f(x))^2$ (b) $f(x + y) = f(x) + f(y)$ (c) $f(|x|) = |f(x)|$ (d) none of these

Watch Video Solution

180. The range of `F(X) = Cos [X], Where – π/ 2 < X < π/ 2 . is

A. a. $\{-1, 1, 0\}$

B. b. $\{\cos 1, \cos 2, 1\}$

C. c. $\{\cos 1, -\cos 1, 1]$

D. d. $[-1, 1]$

Answer: null

Watch Video Solution

181. Which of the following are function: $\{(x, y): y^2 = x, x, y \in R\}$ b. $\{(x, y): y = |x|, x, y \in R\}$ c. $\{(x, y): x^2 + y^2 = 1, x, y \in R\}$ d. $\{(x, y): x^2 - y^2 = 1, x, y \in R\}$

Watch Video Solution

182. If $A = \{1, 2, 3\}$, $B = \{x, y\}$, then the number of functions that can be defined from A into B is 12 b. 8 c. 6 d. 3

Watch Video Solution

183. If $x \neq 1$ *and* $f(x) = \dfrac{x+1}{x-1}$ is a real function, then $f(f(f(2)))$ is (a) 1 (b) 2 (c) 3 (d) 4

Watch Video Solution

184. If $f(x) = \cos\left((\log)_e x\right),$ *then* $f\left(\dfrac{1}{x}\right)f\left(\dfrac{1}{y}\right) - \dfrac{1}{2}\left\{f(xy) + f\left(\dfrac{x}{y}\right)\right\}$ is equal to a.$\cos(x-y)$ b. $\log(\cos(x-y))$ c. 0 d. $\cos(x+y)$

Watch Video Solution

185. Let $A = \{x \in R : x \neq 0, \ -4 \leq x \leq 4\}$ and $f : A \to R$ be defined by $f(x) = \dfrac{|x|}{x}$ for $x \in A$. Then f is a.$\{-1, 1\}$ b. $(3/4, 1]$ c. $[3/4, 1]$ d. $(3/4, 1)$

Watch Video Solution

186. Let $f(x) = x, g(x) = \frac{1}{x}$ and $h(x) = f(x)g(x)$. Then $h(x) = 1$ for a.$x \in R$ b. $x \in Q$ c. $x \in R - Q$ d. $x \in R, x \neq 0$

Watch Video Solution

187. If $f: R \to R: x \neq 0, \ -4 \leq x \leq 4$ and $f: A \to A$ be defined by $f(x) = \frac{|x|}{x}$ for $x \in A$. Then A is a.$\{1, \ -1\}$ b. $\{x: 0 \leq x \leq 4\}$ c. $\{1\}$ d. $\{x: \ -4 \leq x \leq 0\}$

Watch Video Solution

188. If $f: R\vec{R}$ and $g: R\vec{R}$ are defined by $f(x) = 2x + 3 and g(x) = x^2 + 7,$ then the value of x such that $g(f(x)) = 8$ a,1, 2 b.$-1, 2$ c.$-1, \ -2$ d.$1, \ -2$

Watch Video Solution

189. If $f:[-2,2] \to R$ is defined by $f(x) = \{-1$,for $-2 \le x \le 0$, then $x-1$, for $0 \le x \le 2\ [x \in [-2,2]: x \le 0$ and $f(|x|) = x\} =$

Watch Video Solution

190. If $f(x) = 64x^3 + \frac{1}{x^3}$ and α, β are the roots of $4x + \frac{1}{x} = 3$. Then,value of f(x)=

Watch Video Solution

191. The domain of the function $f(x) = \sqrt{2 - 2x - x^2}$ is $[-\sqrt{3}, \sqrt{3}]$ b. $[1-\sqrt{3}, 1+\sqrt{3}]$ c. $[-2,2]$ d. $[-2-\sqrt{3}, -2+\sqrt{3}]$

Watch Video Solution

192. The domain of the function $f(x) = \frac{(x+1)(x-3)}{x-2}$ is a. $[-1,2) \cup [3,\infty)$ b. $(-\infty, -3) \cup (2,5)$ c. $(-\infty, -3] \cup [2,5]$ d.

none of these

Watch Video Solution

193. The domain of the function $f(x)=\sqrt{\frac{(x+1)(x-3)}{x-2}}$ is $[-1,2)\cup[3,\infty)$ b. $(-1,2)\cup[3,\infty)$ c. $[-1,2]\cup[3,\infty)$ d. none of these

Watch Video Solution

194. The domain of definition of the function $f(x)=\sqrt{x-1}+\sqrt{3-x}$ is a.$[1,\infty)$ b. $(-\infty,3)$ c. $(1,3)$ d. $[1,3]$

Watch Video Solution

195. The domain of definition of the function $f(x)=\sqrt{\frac{x-2}{x+2}}+\sqrt{\frac{1-x}{1+x}}$ is a.$(-\infty,-2]\cup[2,\infty)$ b. $[-1,1]$ c. φ d. none of these

Watch Video Solution

196. The domain of definition of the function $f(x) = \log|x|$ is a.R b. $(-\infty, 0)$ c. $(0, \infty)$ d. $R - \{0\}$

Watch Video Solution

197. The domain of definition of $f(x) = x - 3 - 2\sqrt{x-4} - x - 3 + 2\sqrt{x-4}$ is a. $[4, \infty)$ b. $(-\infty, 4]$ c. $(4, \infty)$ d. $(-\infty, 4)$

Watch Video Solution

198. The domain of the function $f(x) = \sqrt{5|x| - x^2 - 6}$ is (a) $(-3, -2) \cup (2, 3)$ b. $[-3, -2) \cup [2, 3)$ c. $[-3, -2] \cup [2, 3]$ d. none of these

Watch Video Solution

199. The range of the function $f(x) = \frac{x+2}{|x+2|}, \ x \neq -2$ is $\{-1, 1\}$ b. $\{-1, 0, 1\}$ c. $\{1\}$ d. $(0, \infty)$

Watch Video Solution

200. The range of the function $f(x) = \frac{x}{|x|}$ is a.$R - \{0\}$ b. $R - \{-1, 1\}$ c. $\{-1, 1\}$ d. none of these

Watch Video Solution