RAVI MATHS TUITION CENTER ,GKM COLONY, CH- 82. PH: 8056206308

10th Relations and Functions test 1

Date : 14-Jun-19

10th Standard 2019 EM

Maths

Reg.No. : | | | | | | |

Time : 00:50:00 Hrs

Total Marks : 35

5 x 1 = 5

1) If n(A x B) =6 and A={1,3} then n(B) is

(a) 1 (b) 2 (c) 3 (d) 6

2) A={a,b,p}, B={2,3}, C={p,q,r,s} then n[(A U C) x B] is

(a) 8 (b) 20 (c) 12 (d) 16

3) If A={1,2}, B={1,2,3,4}, C={5,6} and D={5,6,7,8} then state which of the following statement is true..

(a) (A x C) ⊂ (B x D) (b) (B x D) ⊂ (A x C) (c) (A x B) ⊂ (A x D) (d) (D x A) ⊂ (B x A)

4) If there are 1024 relations from a set A = {1, 2, 3, 4, 5} to a set B, then the number of elements in B is

(a) 3 (b) 2 (c) 4 (d) 8

5) The range of the relation R ={(x,x^2) |x is a prime number less than 13} is

(a) {2,3,5,7} (b) {2,3,5,7,11} (c) {4,9,25,49,121} (d) {1,4,9,25,49,121}

5 x 2 = 10

6) If A = {1,3,5} and B = {2,3} then

(i) find A x B and B x A

(ii) Is A x B = B x A? If not why?

(iii) Show that n(A×B) = n(B×A) = n(A)× n(B)

7) If A x B = {(3,2), (3,4), (5,2), (5,4)} then find A and B.

8) Let A = {x ∈ N| 1 < x < 4}, B={x ∈ W| 0 ≤ x < 2) and C={x ∈ N| x < 3} Then verify that

(i) A x (B U C) = (A x B) U (A x C)

(ii) A x (B ∩ C) = (A x B) ∩ (A x C)

9) Let X={1,2,,4} and Y={2,4,6,8,10} and R={(1,2),(2,4),(3,6),(4,8)} Show that R is a function and find its domain, co-domain and range?

10) A relation 'f' is defined by f(x)=x^2-2 where x∈ {-2,-1,0,3}

(i) List the elements of f

(ii) Is f a function?

4 x 5 = 20

11) Let A = {3,4,7,8} and B = {1,7,10}. Which of the following sets are relations from A to B?

(i) R_1={(3,7), (4,7), (7,10), (8,1)}

(ii) R_2= {(3,1), (4,12)}

(iii) R_3= {(3,7), (4,10), (7,7), (7,8), (8,11), (8,7), (8,10)}

12) Using vertical line test, determine which of the following curves (Fig.1.18(a), 1.18(b), 1.18(c), 1.18(d)) represent a function?

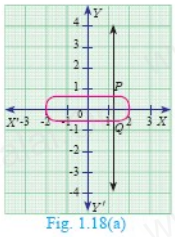

Fig. 1.18(a)

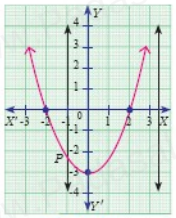

Fig. 1.18(b)

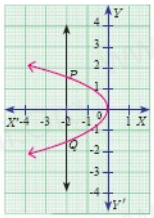

Fig. 1.18(c)

13) Let A = {1,2,3,4} and B ={2,5,8,11,14} be two sets. Let f: A ⟶ B be a function given by f(x)=3x−1. Represent this function

(i) by arrow diagram

(ii) in a table form

(iii) as a set of ordered pairs

(iv) in a graphical form

14) A functionf: [-7,6) ⟶ R is defined as follows.

$$f(x)=\begin{cases} x^2+2x+1 & -7\le x<-5 \\ x+5 & -5\le x\le 2 \\ x-1 & 2<x<6 \end{cases}$$

find 2f(-4) + 3/(2)

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10th Relations and Functions test 2

Date : 14-Jun-19

10th Standard 2019 EM

Maths

Reg.No. : | | | | | | |

Time : 00:45:00 Hrs

Total Marks : 30

5 x 1 = 5

1) If the ordered pairs (a+2,4) and (5,2a+b) are equal then (a,b) is

(a) (2,-2) (b) (5,1) (c) (2,) (d) (3,-2)

2) Let n(A)= m and n(B) = n then the total number of non-empty relations that can be defined from A to B is

(a) m^n (b) n^m (c) 2^{mn}-1 (d) 2^{mn}

3) If {(a,8),(6,b)}represents an identity function, then the value of a and b are respectively

(a) (8,6) (b) (8,8) (c) (6,8) (d) (6,6)

4) Let A={1,2,3,4} and B={4,8,9,10}. A function f: A ⟶ B given by f={(1,4), (2,8), (3,9), (4,10)} is a

(a) Many-one function (b) Identity function (c) One-to-one function (d) Into function

5) If $f(x)=2x^2$ and $g(x)=\frac{1}{3x}$, then f o g is

(a) $\frac{3}{2x^2}$ (b) $\frac{2}{3x^2}$ (c) $\frac{2}{9x^2}$ (d) $\frac{1}{6x^2}$

5 x 2 = 10

6) If X = {−5,1,3,4} and Y = {a,b,c}, then which of the following relations are functions from X to Y ?

(i) R_1= {(−5,a), (1,a), (3,b)}

(ii) R_2= {(−5,b), (1,b), (3,a),(4,c)}

(iii) R_3 = {(−5,a), (1,a), (3,b),(4,c),(1,b)}

7) Find f o g and g o f when f(x)=2x+1 and $g(x)=x^2$-2

8) Represent the function f(x)=$\sqrt{2x^2-5x+3}$ as a composition of two functions.

9) If f(x)=2x+3, g(x)=1-2x and h(x)=3x. Prove that f 0 (f o g) o h.

10) Find x if gff(x) = fgg(x), given f(x) = 3x+1 and g(x)=x+.

3 x 5 = 15

11) Let f be a function f:N ⟶ N be defined by f(x) = 3x+2x ∈ N

(i) Find the images of 1, 2, 3

(ii) Find the pre-images of 29, 53

(ii) Identify the type of function

12) Forensic scientists can determine the height (in cms) of a person based on the length of their thigh bone. They usually do so using the function h(b)=2.47b+54.10 where b is the length of the thigh bone.

(i) Check if the function h is one – one

(ii) Also find the height of a person if the length of his thigh bone is 50 cms.

(iii) Find the length of the thigh bone if the height of a person is 14796 cms.

13) If the function f: R⟶ R defined by

$$f(x)=\begin{cases}2x+7, x<-2\\ x^2- \ \ 2, -2\le x<3\\ 3x-2, x\ge 3\end{cases},$$

(i) f(4)

(ii) f(-2)

(iii) f(4)+2f(1)

(iv) $\frac{f(1)-3f(4)}{f(-3)}$

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10th Relations and Functions test 3

Date : 14-Jun-19

10th Standard 2019 EM

Maths

Reg.No. : | | | | | | |

Time : 00:50:00 Hrs

Total Marks : 35

5 x 1 = 5

1) If f: A ⟶ B is a bijective function and if n(B) =8, then n(A) is equal to

(a) 7 (b) 49 (c) 1 (d) 14

2) Let f and g be two functions given by

f={(0,1), (2,0), (3,-4), (4,2), (5,7)}

g={(0,2), (1,0), (2,4), (-4,2), (7,0)} then the range of f o g is

(a) {0,2,3,4,5} (b) {–4,1,0,2,7} (c) {1,2,3,4,5} (d) {0,1,2}

3) Let f(x) = $\sqrt{1+x^2}$ then

(a) f(xy) = f(x).f(y) (b) f(xy) ≥ f(x).f(y) (c) f(xy) ≤ f(x).f(y) (d) None of these

4) If g={(1,1), (2,3), (3,5), (4,7)} is a function givrn by g(x)=αx+β then the values of α and β are

(a) (-1,2) (b) (2,-1) (c) (-1,-2) (d) (1,2)

5) $f(x) = (x+1)^3 - (x-1)^3$ represents a function which is

(a) linear (b) cubic (c) reciprocal (d) quadratic

5 x 2 = 10

6) Given $f(x) = 2x-x^2$, find

(i) f (1)

(ii) f (x+1)

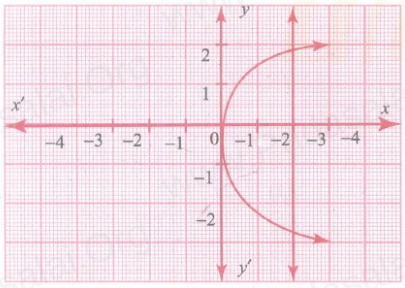
(iii) f (x) + f (1)

7) Find k if f o g(k) = 5 where f(k)=2k-1.

8) LetA= {1,2, 3, 4} and B = {-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12} Let R = {(1, 3), (2, 6), (3, 10), (4, 9)} ⊆ A x B bea relation. Show that R is a function and find its domain, co-domain and the range of R.

9) Let A = {0, 1, 2, 3} and B = {1, 3, 5, 7, 9} be two sets. Letf: A ⟶ B be a function given by f(x) = 2x + 1. Represent this function as a set of ordered pairs.

10) State whether the graph represent a function. Use vertical line test.



4 x 5 = 20

11)

Using horizontal line test (Fig.1.35(a), 1.35(b), 1.35(c)), determine which of the following functions are one – one.

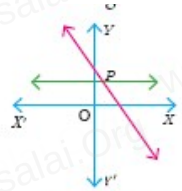


Fig. 1.35(a)

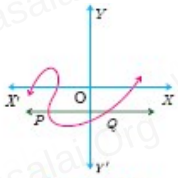


Fig. 1.35(b)

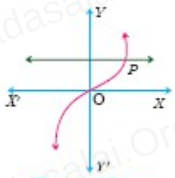


Fig. 1.35(c)

12) The distance S (in kms) travelled by a particle in time 't' hours is given by $S(t)=\frac{t^2+t}{2}$. Find the distance travelled by the particle after

(i) three and half hours.

(ii) eight hours and fifteen minutes.

13) A functionf: [-7,6) $\rightarrow$ R is defined as follows.

$$f(x)=\begin{cases} x^2+2x+1 & -7\le x<-5 \\ x+5 & -5\le x\le 2 \\ x-1 & 2<x<6 \end{cases}$$

$$\frac{4f(-3)+f2(4)}{f(-6)-3f(1)}$$

14) f(x) = (1+ x)

g(x) = (2x-1)

Show that fo(g(x)) = gof(x)

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