1. Let X = {a,b,c,d} and Y = {e, f,g}. Define functions F and G by the arrow diagrams below.

a) Is F one-to-one? Why or why not? Is it onto? Why or why not?

• b) Is G one-to-one? Why or why not? Is it onto? Why or why not?

a)

- F not one – to – one

Because F(c) = F(d) = e

- F is onto

Because e, f, g (elements of Y) is the image of some element in X

b)

- G not one – one – not and onto

Because

F(a) = F(b) = F(d) = f

g (elements of Y) is not the image of some element in X

1. Define L:Z→Z and M:Z→Z by the rules L(a)=a 2 and M(a) = a mod 5 for all integers a.

a. Find(L◦M)(12), (M◦L)(12), (L◦M)(9), and (M◦L)(9).

b. Is L◦M=M◦L?

1. a. Find(*L*◦*M*)(12), (*M*◦*L*)(12), (*L*◦*M*)(9), and (*M*◦*L*)(9).

b. Is *L*◦*M*=*M*◦*L*?

Answer:

a)

|  |  |
| --- | --- |
| (*L*◦*M*)(a)=L(M(a))  M(12)=2, L(2)=4  (*L*◦*M*)(12)=4 | (*L*◦*M*)(a)=L(M(a))  M(9)=16, L(4)=16  (*L*◦*M*)(9)=16 |
| (*M*◦*L*)(a)= M(L(a))  L(12)=144, M(144)=4  (*M*◦*L*)(12)=4 | (*M*◦*L*)(a)=M(L(a))  L(9)=81, M(81)=1  (*M*◦*L*)(9)=1 |

b)

(M∘L)(12)=(L∘M)(12)

But (M∘L)(9)≠(L∘M)(9)

Thus, M∘L≠L∘M

1. Find an equation for the inverse for each of the function given below.
2. F(x)=35x-1

Y= 35x-1 (Replace f(x) with y)

X=35y-1 (swith x and y)

Since y can be is dated, an inverse of this function can’t befound

1. F(x) =

Y= (Replace f(x) with y)

Y(3x+5)=2x-7

= x

1. F(x)= ln(2x-1) (x>1/2)

Y=ln(2x-1) (Replace f(x) with y)

2x-1=ey

X=

1. F(x)=1/(3x+1)

Y=1/(3x+1) (Replace f(x) with y)

Y(3x+1)=1

X=

1. F(x)=

Y= (Replace f(x) with y)

2y+5=3

()2=x

1. F(x)= (x>17)

Y= (Replace f(x) with y)

3y= x-7

X=(3y+7)\*2