Let the universe set U={1,2,3,...,10}.

Let A={1,4,7,10} B={1,2,3,4,5} C={2,4,6,8}

List the elements of each set.

$A \cup B =$ {1,2,3,4,7,5,10}

$B - A =$ {2,3,5}

$\overline{U} =$ Ø

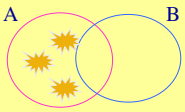
$A \cup U =$ U

$\overline{B} \cap (C - A) =$ {6,8}

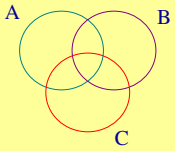
$(A \cup B) - (C - B) =$ {1,2,3,4,5,7,10}

Draw a Venn diagram and shade the given set.

$A \cap \overline{B}$

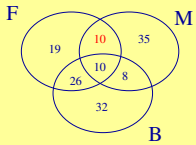


$((C \cap A) - (\overline{B - A})) \cap C$



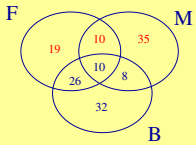
There is a group of 191 students. 10 students are taking French, Business and Music; 36 are taking French and Business; 20 are taking French and Music; 18 are taking Business and Music; 65 are taking French; 76 are taking Business and 63 are taking Music.

How many are taking French and Music not Business ?



There is a group of 191 students. 10 students are taking French, Business and Music; 36 are taking French and Business; 20 are taking French and Music; 18 are taking Business and Music; 65 are taking French; 76 are taking Business and 63 are taking Music.

How many are taking Music or French (or both) but not Business?



Write "true" if the statement is true; otherwise give a counterexample. The sets X, Y and Z are subsets of a universal set U. Assume that the universe for Cartesian products is UxU.

$(X \cap Y) \cup (Y - X) = X$ for all sets X and Y

False

X={1} Y={1,2}

For the sequence a defined by

$a_i = i^2 - 3i + 3$ n≥1

Find $\sum_{i=1}^{4} a_i =$ 12

Find $\prod_{i=3}^{4} a_i =$ 21

Using the sequences y and z defined by

$y_i = 2^i - 1$

$z_i = i(i-1)$

Find $\left(\sum_{i=1}^{3} y_i\right)\left(\sum_{i=1}^{3} z_i\right) =$ 88

Find $\left(\sum_{i=1}^{4} y_i\right)\left(\prod_{i=2}^{4} z_i\right) =$ 3744

Does 9450 represent a number in binary? In octal? In decimal ? In hexadecimal?

E E H H

1101010 represents in decimal, in hexadecimal.

E

For the relation R on the set {1,2,3,4,5} defined by the rule $(x,y) \in R$ if $x+y \leq 6$

List the elements of R

R={(1,1)(1,3)(1,2)(1,4)(1,5)(2,2)(2,1)(2,3)(2,4)(3,3)(3,2)(3,1)(4,1)(4,2)(5,1)}

Find the range of R

R={1,2,3,4,5}

Find the range of R^{-1}

Dom(R)=Rng(R)=Rng(R^{-1})={1,2,3,4,5}

Give examples of relations on {1,2,3,4} having the properties specified

Reflexive, symmetric and non transitive

R={(1,1)(2,2)(3,3)(4,4)(1,2)(2,1)(2,3)(3,2)}

Non reflexive, symmetric, not antisymmetric and transitive

R={(1,1)(1,2)(2,1)(2,2)}

Let R and S be relations on X. Determine statement is true or false?
If the statement is false give a counterexample

If R and S are antisymmetric, then $R \cup S$ is antisymmetric

FALSE

R={(1,2)} S={(2,1)} $R \cup S$={(1,2)(2,1)}

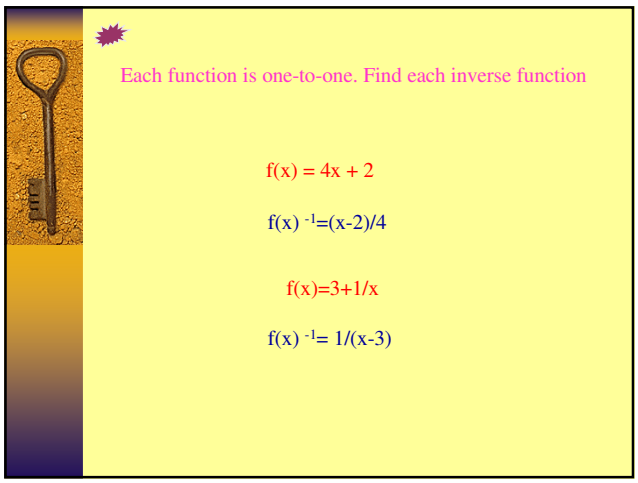
Determine whether the given relation is an equivalence relation on {1,2,3,4,5}. Given relation is true or false ?

{(1,1)(2,2)(3,3)(4,4)(5,5)(1,5)(5,1)(3,5)(5,3)(1,3)(3,1)

TRUE

{(x,y) | 3 divides x+y}

FALSE


Each function is one-to-one. Find each inverse function
f(x) = 4x + 2
f(x) -1=(x-2)/4
f(x)=3+1/x
f(x) -1= 1/(x-3)