




Find solutions for your homework

Search

2 Bookmarks

Show all steps: 
[home](#) / [study](#) / [math](#) / [discrete math](#) / [discrete math solutions manuals](#) / [discrete mathematical structures / 6th edition](#) / [chapter 1.2](#) / [problem 25e](#)

Discrete Mathematical Structures | (6th Edition)

[See this solution in the app](#)

Problem

In a survey of 260 college students, the following data were obtained:

64 had taken a mathematics course,

94 had taken a computer science course,

58 had taken a business course,

28 had taken both a mathematics and a business course,

26 had taken both a mathematics and a computer science course,

22 had taken both a computer science and a business course, and

14 had taken all three types of courses.

(a) How many students were surveyed who had taken none of the three types of courses?

(b) Of the students surveyed, how many had taken only a computer science course?

Step-by-step solution

Step 1 of 3

(a)

In a survey of 260 college students, 64 had taken a mathematics course, 94 had taken a computer science, 58 had taken a business course, 28 had taken both a mathematics and a business course, 26 had taken both a mathematics and a computer science course, 22 had taken both a computer science and a business course, and 14 had taken all three types of courses. We need to find the number of students was surveyed who had taken none of the three types of courses.

Let A be the set of students who have taken mathematics, B be the set of student who have taken computer science and C be the set of students who have taken business course.

Thus,

$$|A| = 64, |B| = 94, |C| = 58, |A \cap B| = 26, |B \cap C| = 22, |A \cap C| = 28, |A \cap B \cap C| = 14.$$

Now, the number of students who have taken at least one course is

$$\begin{aligned} |A \cup B \cup C| &= |A| + |B| + |C| - |A \cap B| - |B \cap C| - |C \cap A| + |A \cap B \cap C| \\ &= 64 + 94 + 58 - 26 - 22 - 28 + 14 \\ &= 154. \end{aligned}$$

Hence, numbers of students who had taken none of the three types of courses is

$$260 - 154 = 106.$$

[Comment](#)

Step 2 of 3

Post a question

Answers from our experts for your tough homework questions

Continue to post

15 questions remaining



Snap a photo from your phone to post a question
We'll send you a one-time download link

888-888-8888

Text me

By providing your phone number, you agree to receive a one-time automated text message with a link to the app. Standard messaging rates may apply.

My Textbook Solutions



Discrete...
6th Edition



Principles of
Information...
6th Edition



Principles of
Information...
4th Edition

[View all solutions](#)



In a survey of 260 college students, 94 had taken a mathematics course, 74 had taken a computer science, 58 had taken a business course, 26 had taken both a mathematics and a computer science course, 26 had taken both a mathematics and a business course, 22 had taken both a computer science and a business course, and 14 had taken all three types of courses. We need to find the number of students who had taken only a computer science course.

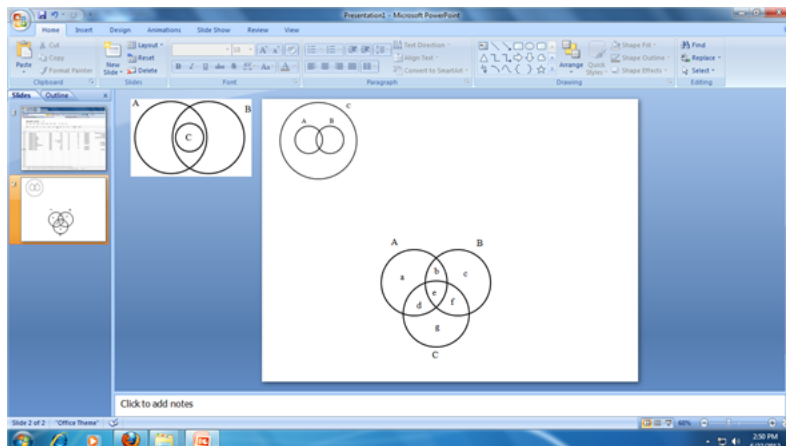
Chapter 1.2, Problem 25E

2 Bookmarks

Show all steps: <

Let A be the set of students who have taken mathematics, B be the set of student who have taken computer science and C be the set of students who have taken business course.

Consider a Venn diagram



In this diagram, small letters denotes the number of student in the respective regions.

Therefore,

$$|B| = b + c + e + f = 94$$

$$|A \cap B| = b + e = 26$$

$$|B \cap C| = e + f = 22$$

$$|A \cap B \cap C| = e = 14.$$

[Comment](#)

Step 3 of 3

Put $e = 14$ in $b + e = 26$ and $e + f = 22$, we get

$$b = 12, f = 8.$$

Put e, f, b in $b + c + e + f = 94$, we get

$$c = 60.$$

Thus, number of students who have taken only a computer science course is

$$c = 60.$$

[Comment](#)

Was this solution helpful?

6

0


Recommended solutions for you in Chapter 1.2

Chapter 1.2, Problem 16E

[See solution](#)

Chapter 1.2, Problem 25E

2 Bookmarks

Show all steps: 

[See more problems in subjects you study](#)

COMPANY 

LEGAL & POLICIES 

CHEGG PRODUCTS AND SERVICES 

CHEGG NETWORK 

CUSTOMER SERVICE 



© 2003-2021 Chegg Inc. All rights reserved.