Analyzing Surveys Using Venn Diagrams:

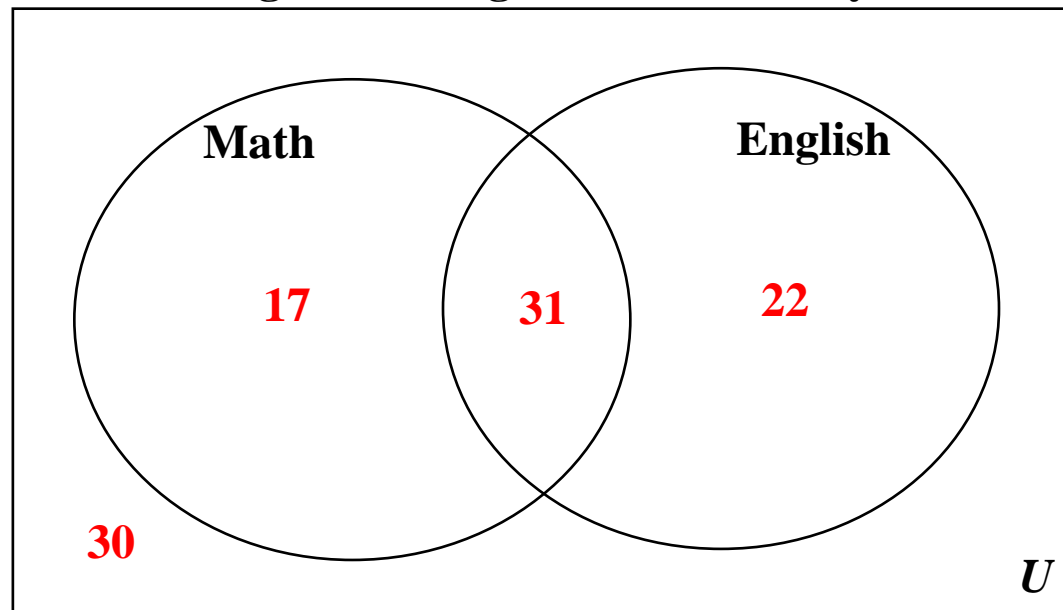**Examples:**

1. A survey of 100 students regarding their semester courses resulted in the following:

> **48 students are taking a Math class**
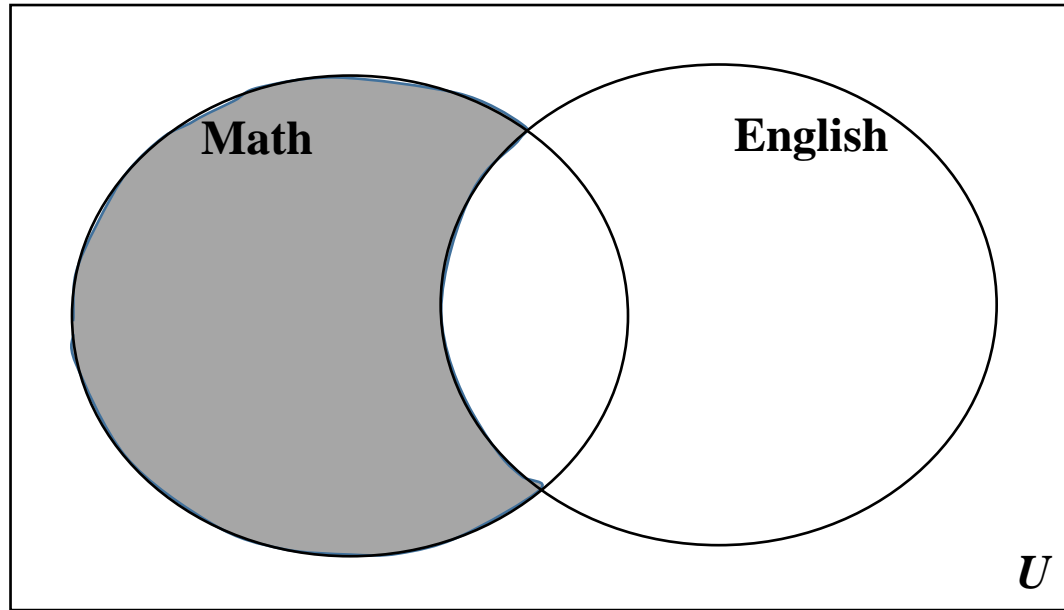>
> **53 students are taking an English class**
>
> **31 students are taking both Math and English classes**

a) Complete the following Venn Diagram of the survey.
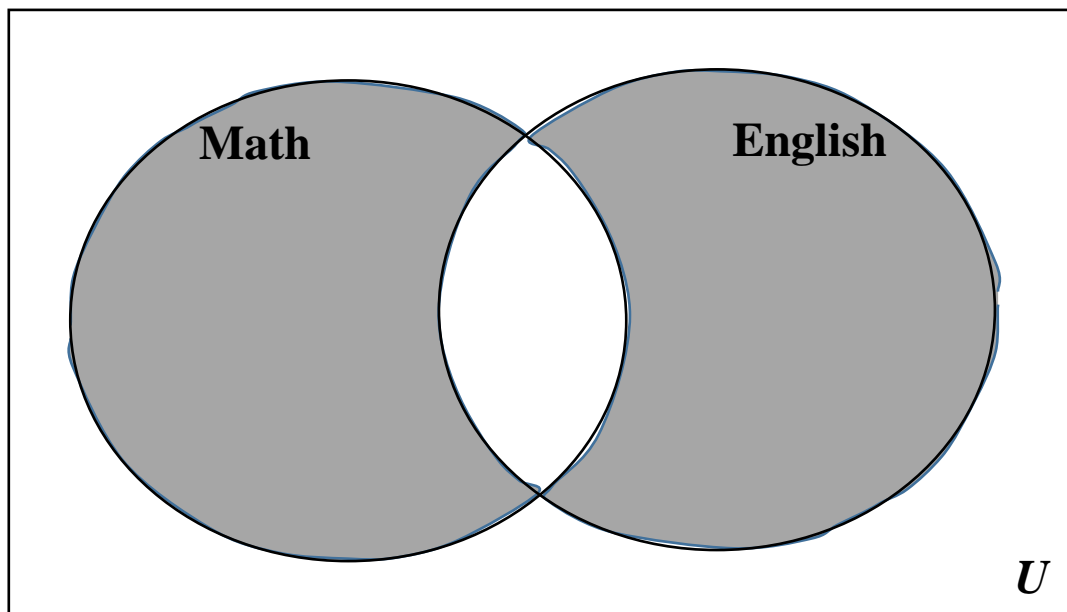
Math   English

17   31   22

30

U

Fill-in the number at the bottom, 31, first. Then work your way up to the top. Be careful, 31 of the 53 students taking English are already accounted for, that's where the 22 comes from.

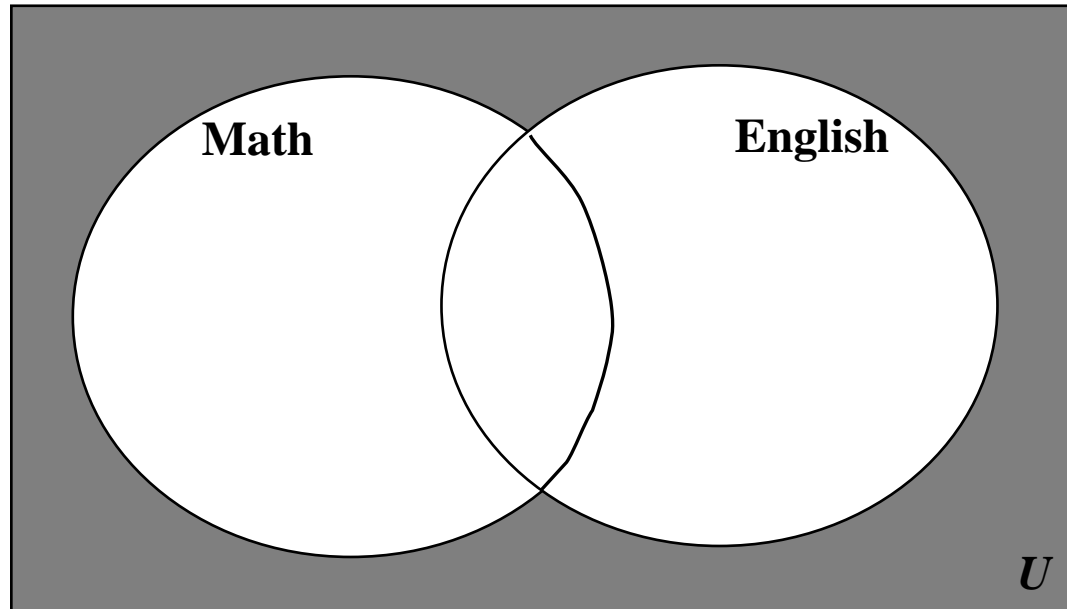**b) How many of the students are taking only a Math class?**

17

c) How many of the students are taking only one of the two classes?

$$17 + 22 = \boxed{39}$$

d) How many of the students aren't taking a Math or English class?

Math

English

U

30

2. A survey of 180 students resulted in the following:

43 students were in a campus club

52 played in a campus sport

35 were in a campus tutorial program
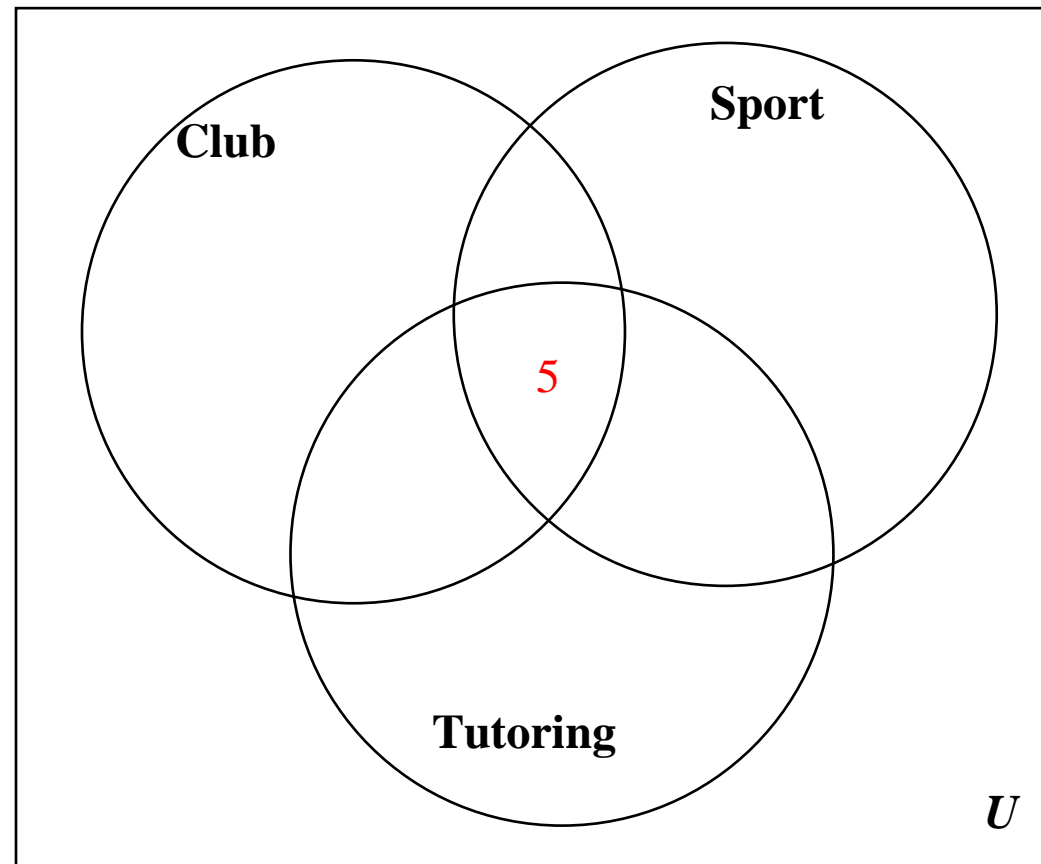
13 were in a club and a sport

14 were in a sport and a tutorial program

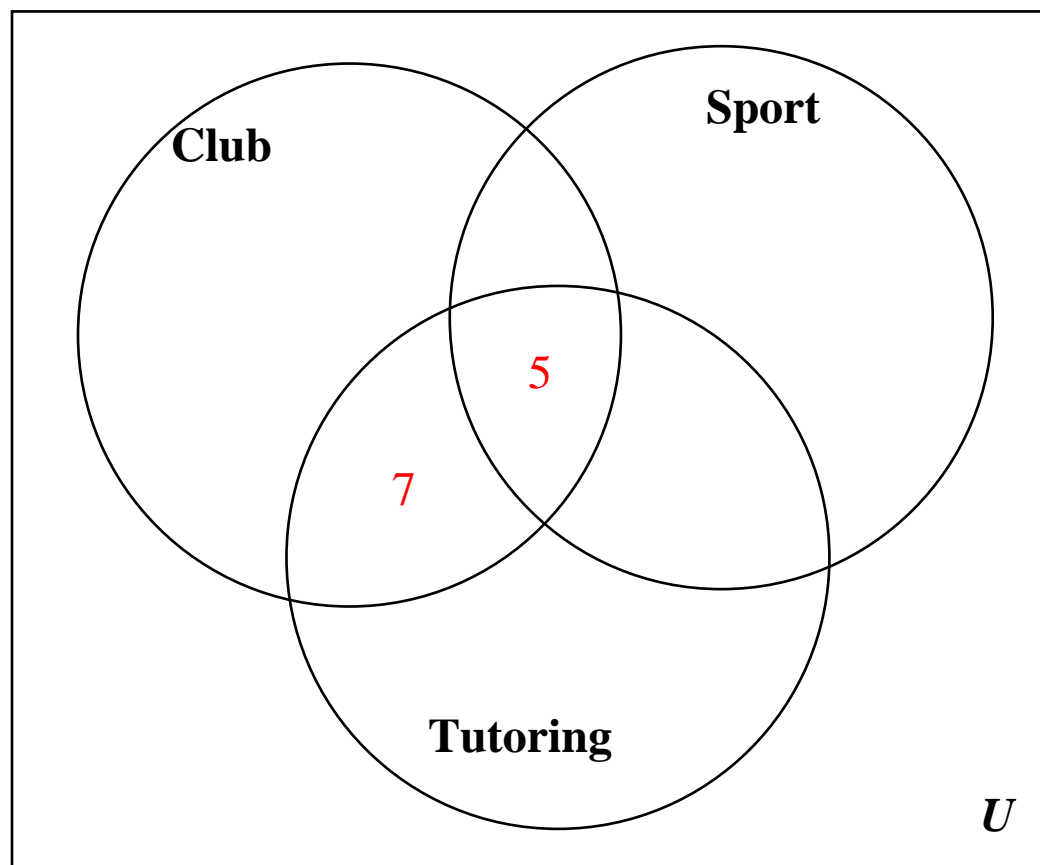**12 were in a club and a tutorial program**

5 were in all three activities

**a) Complete the following Venn Diagram of the survey.**

Start at the bottom with 5 were in all three activities, and put the 5 in the center region.
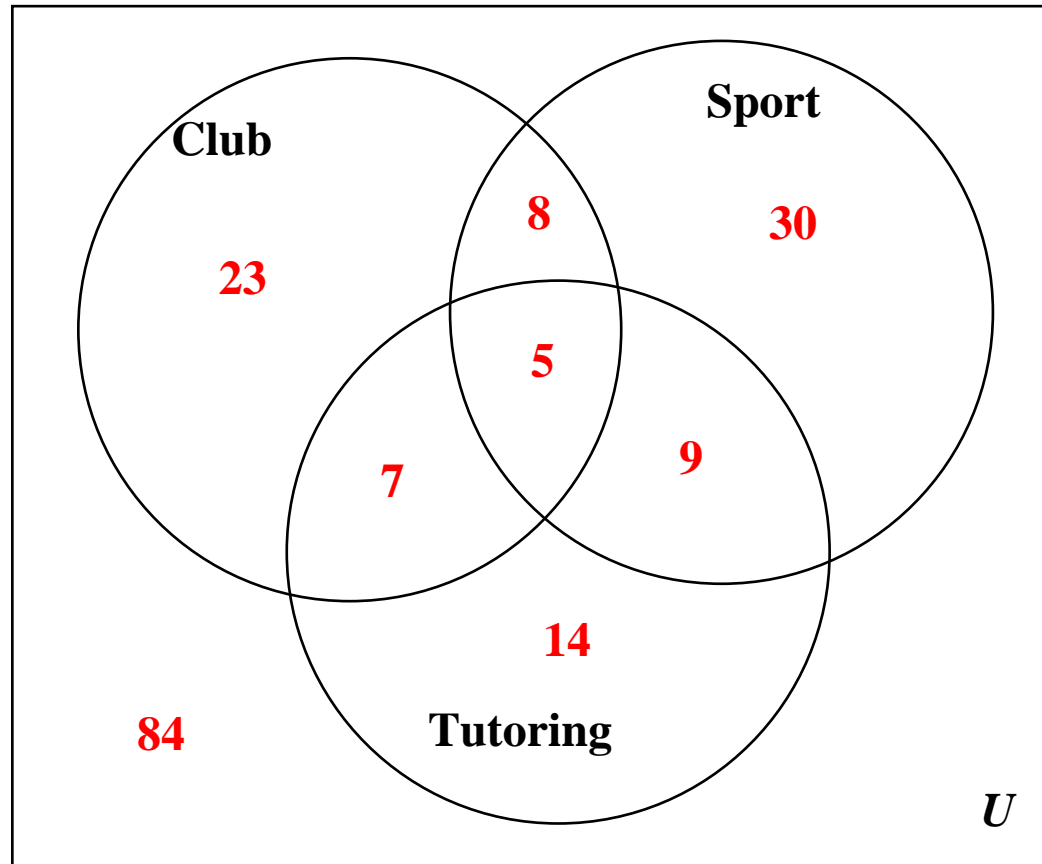
Club

Sport

5

Tutoring

U

Now move up to 12 were in a club and a tutorial program. We know that the total number of people in the overlap region of club and tutorial is 12, and we've already accounted for 5 of them, we need to put the other 7 in the other part of the overlap region of club and tutorial.

Now move up to 14 were in a sport and a tutorial program. We know that the total number of people in the overlap region of sport and tutorial is 14, and we've already accounted for 5 of them, we need to put the other 9 in the other part of the overlap region of sport and tutorial.
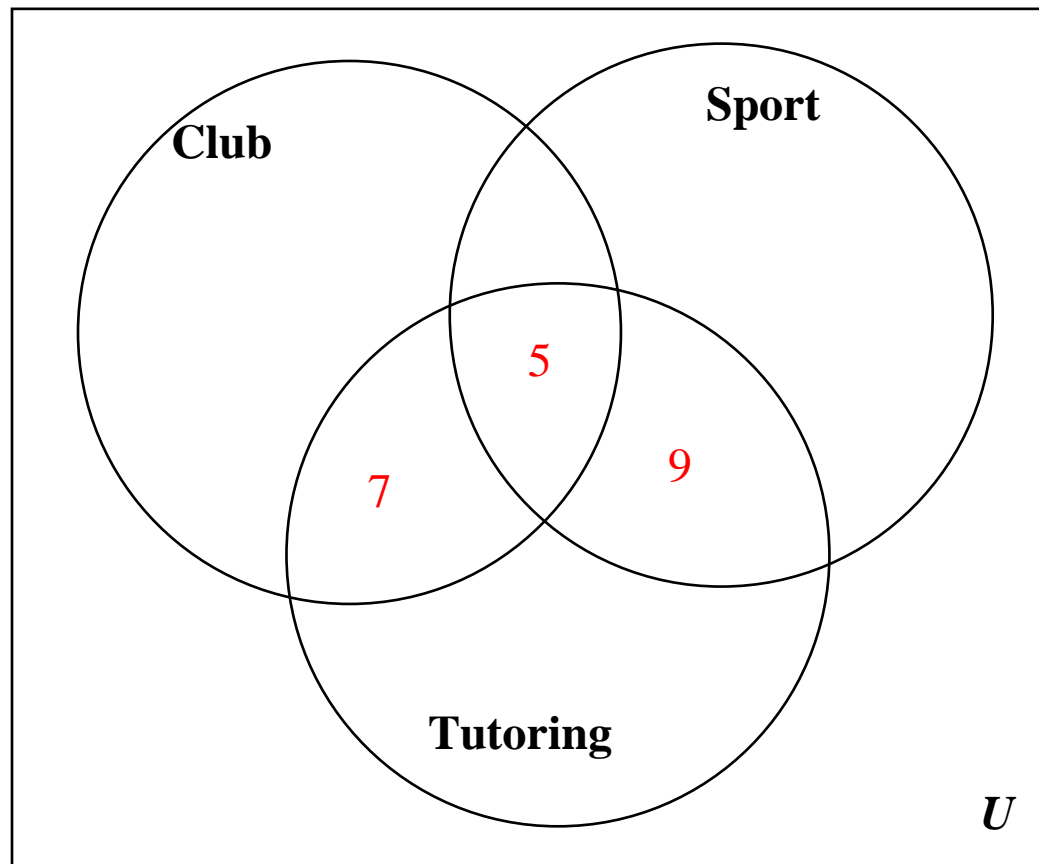
Continue this process of moving toward the beginning until you've used the fact that 180 students were involved in the survey, and you'll have a complete Venn diagram.
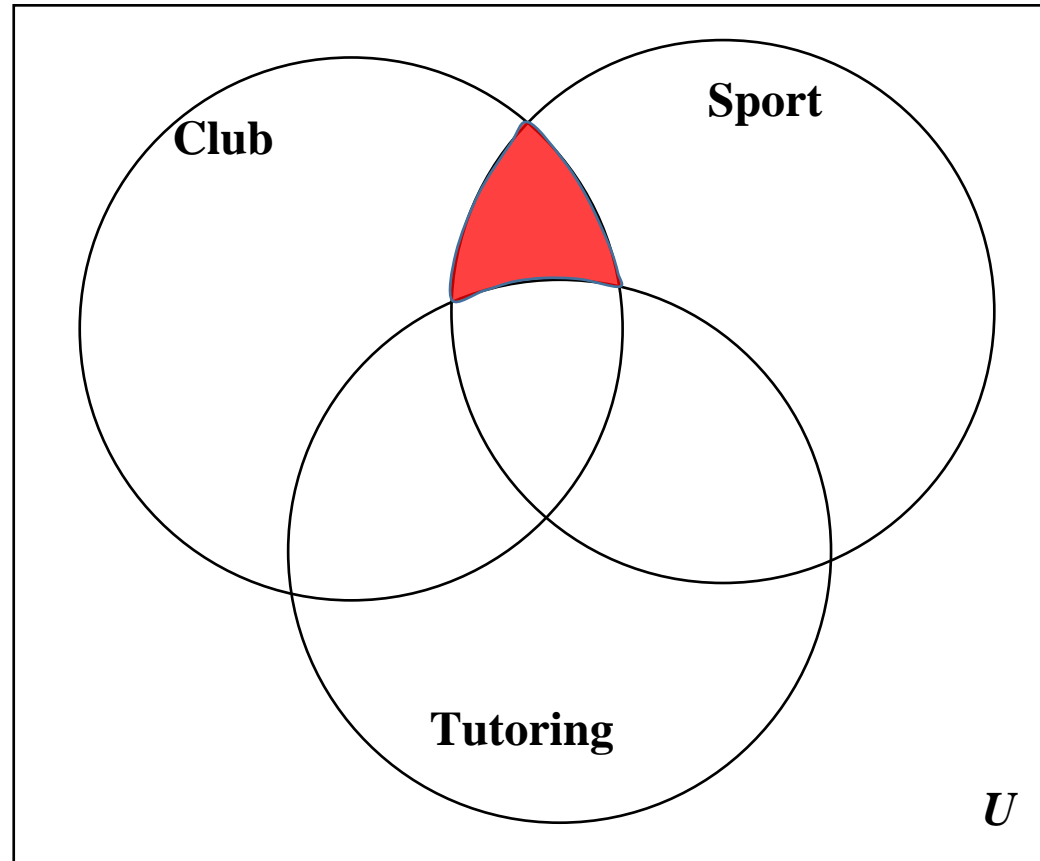
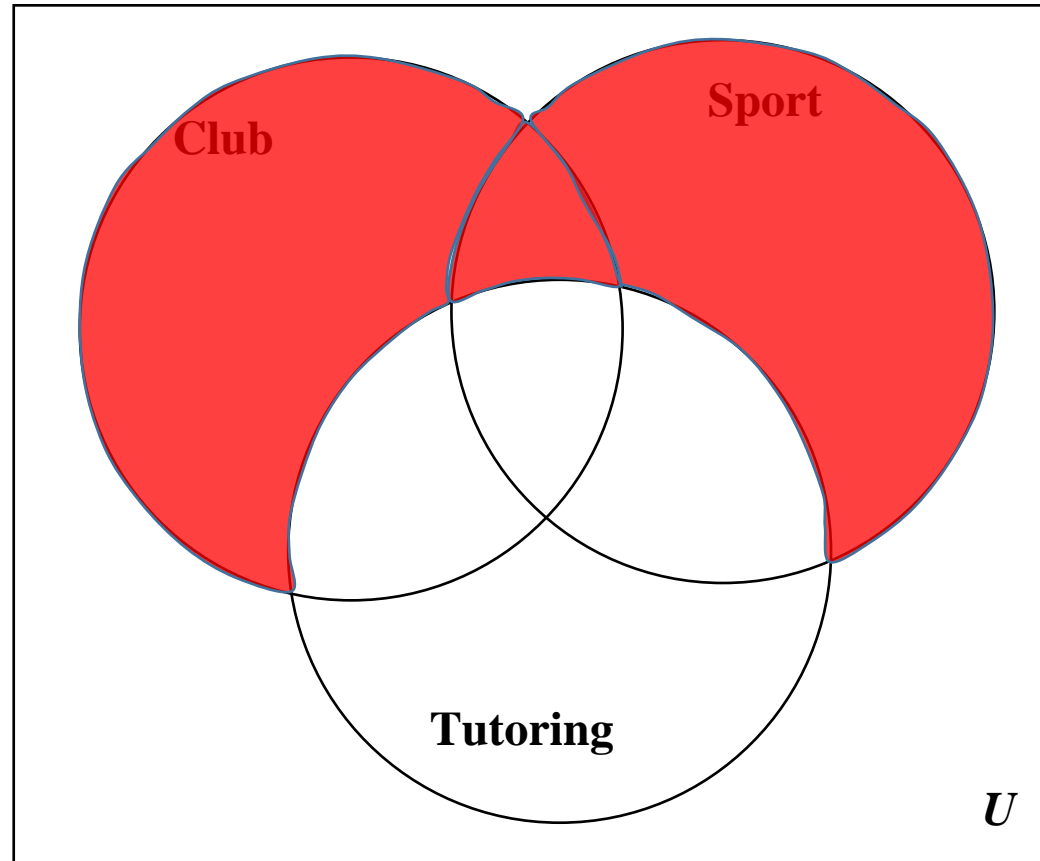**b) How many participated only in a sport?**
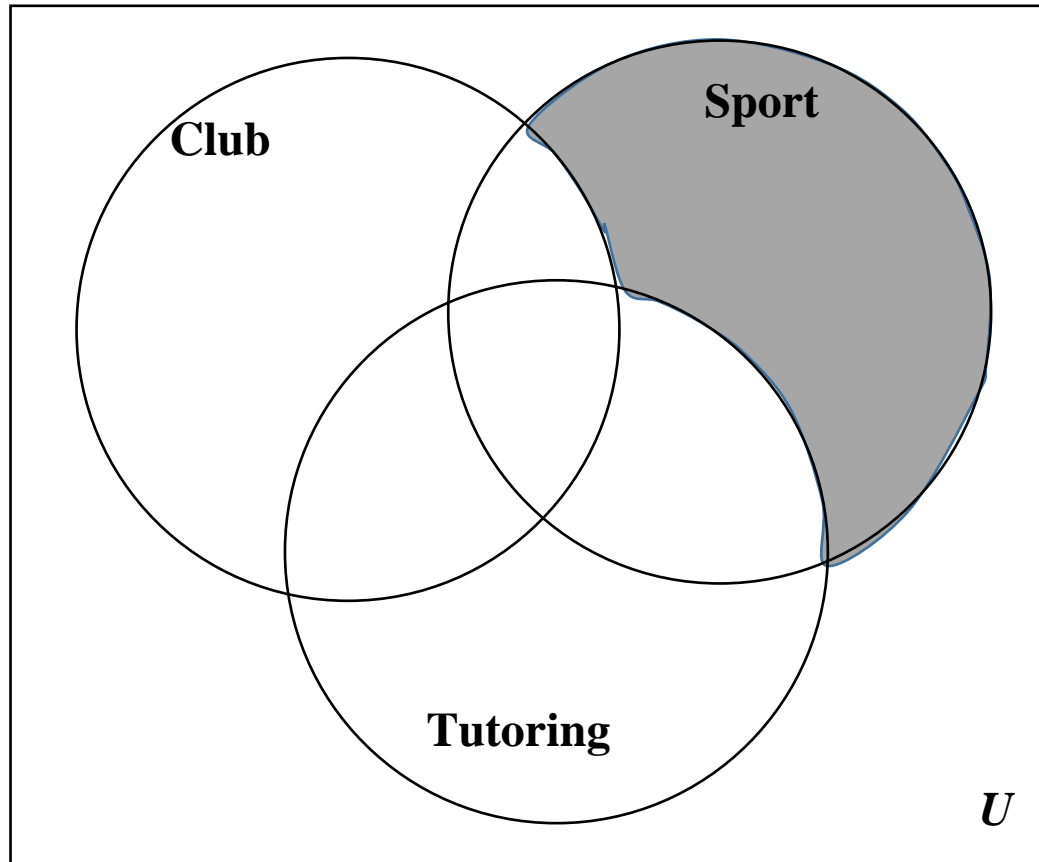
30

c) How many participated in a club and a sport, but not a tutoring program?
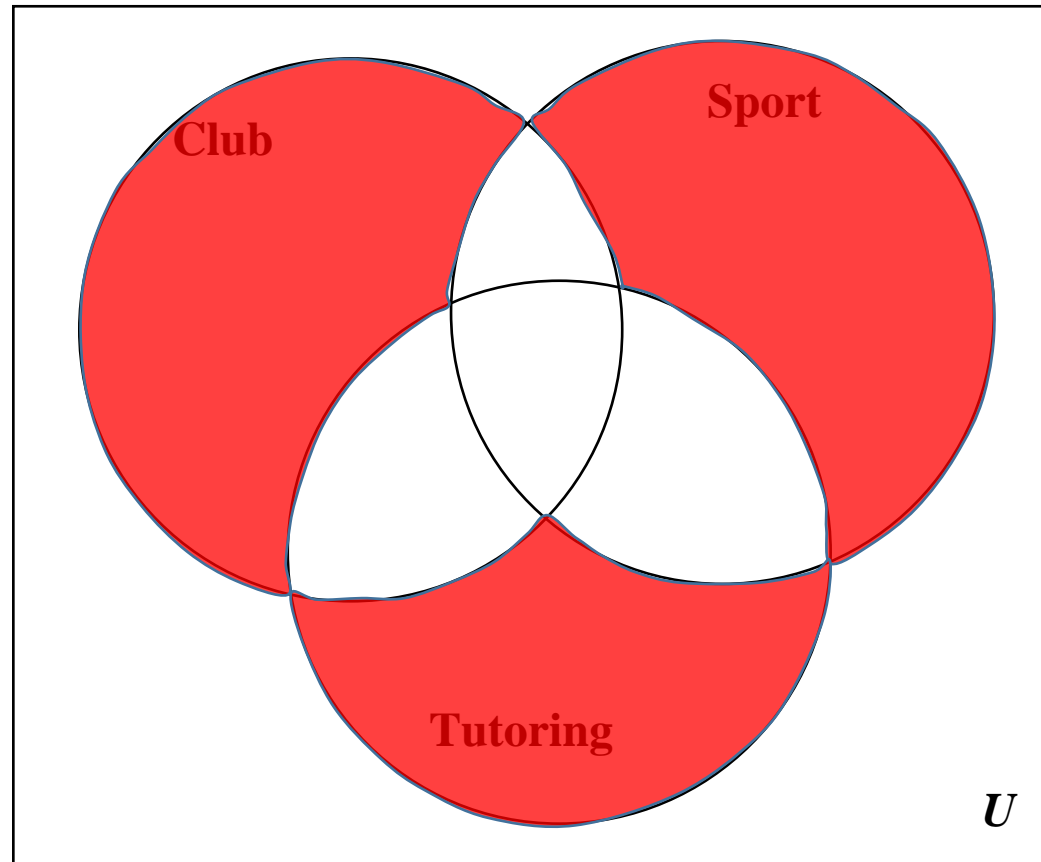

8

d) How many participated in a club or a sport, but not a tutoring program?
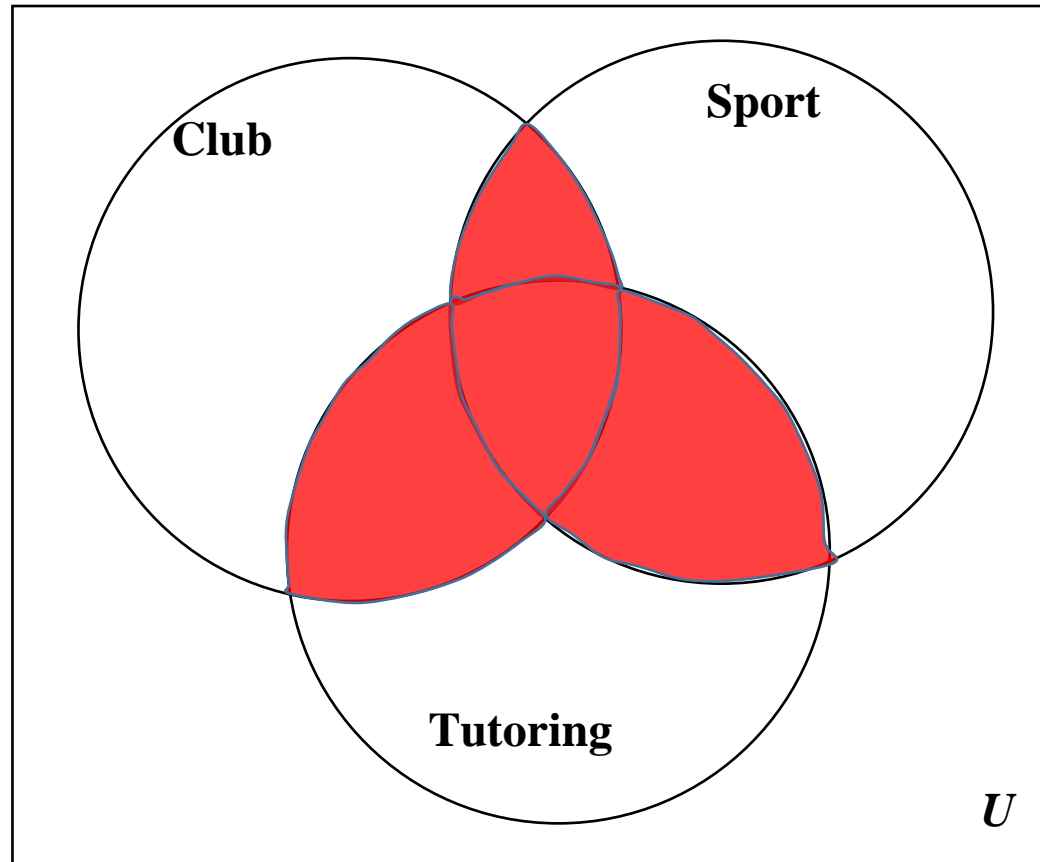

$$23 + 8 + 30 = \boxed{61}$$

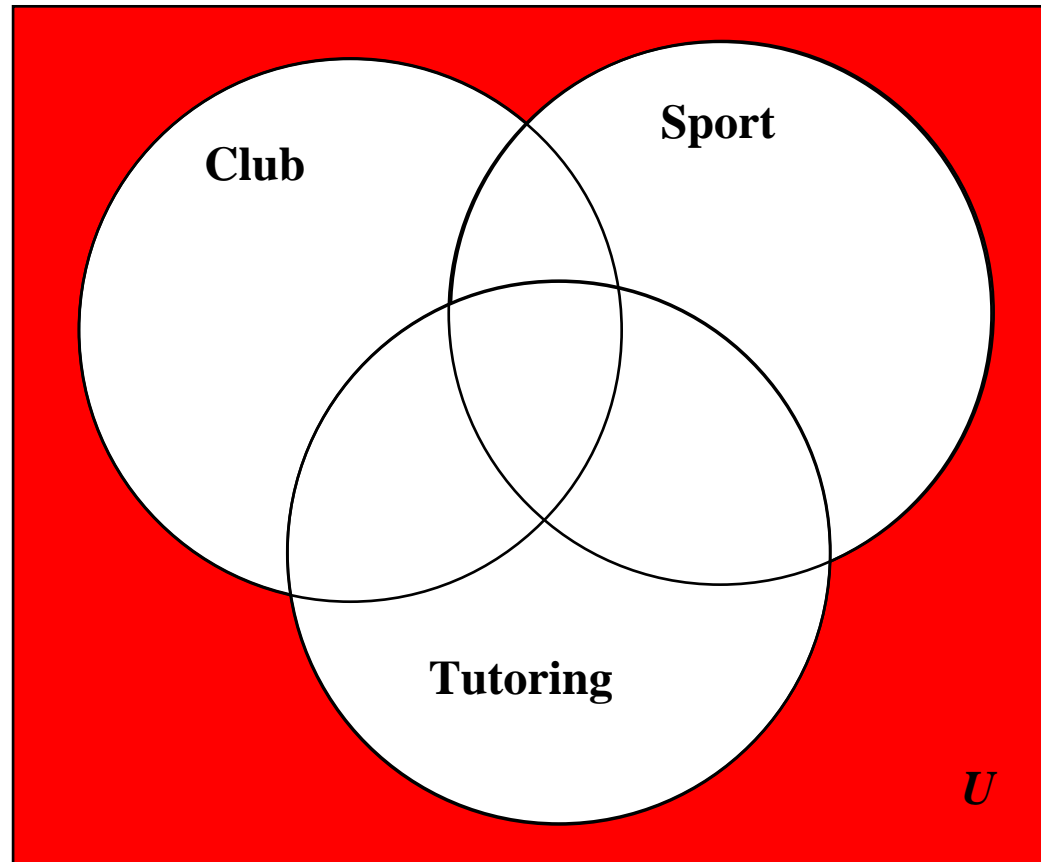**e) How many participated in exactly one of the three activities?**

$23 + 30 + 14 = \boxed{67}$

**f) How many participated in at least two of the activities?**

$7 + 8 + 5 + 9 = \boxed{29}$

**g) How many didn't participate in any of the three activities?**

84

3. A survey of 80 country music songs resulted in the following: 36 songs are about being in jail, 44 songs are about being in love, 26 songs are about driving a truck, 18 songs are about being in jail and being in love, 14 songs are about being in jail and driving a truck, 11 songs are about being in love and driving a truck, and 4 songs are about being in jail and being in love and driving a truck.
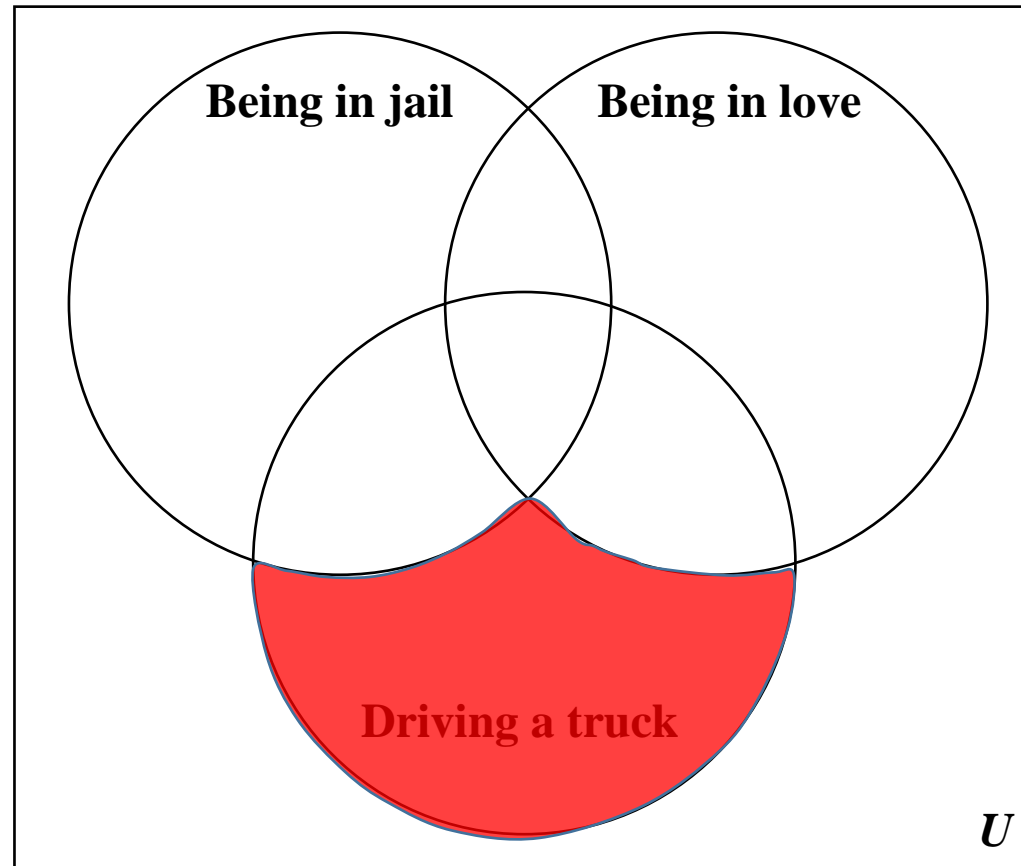
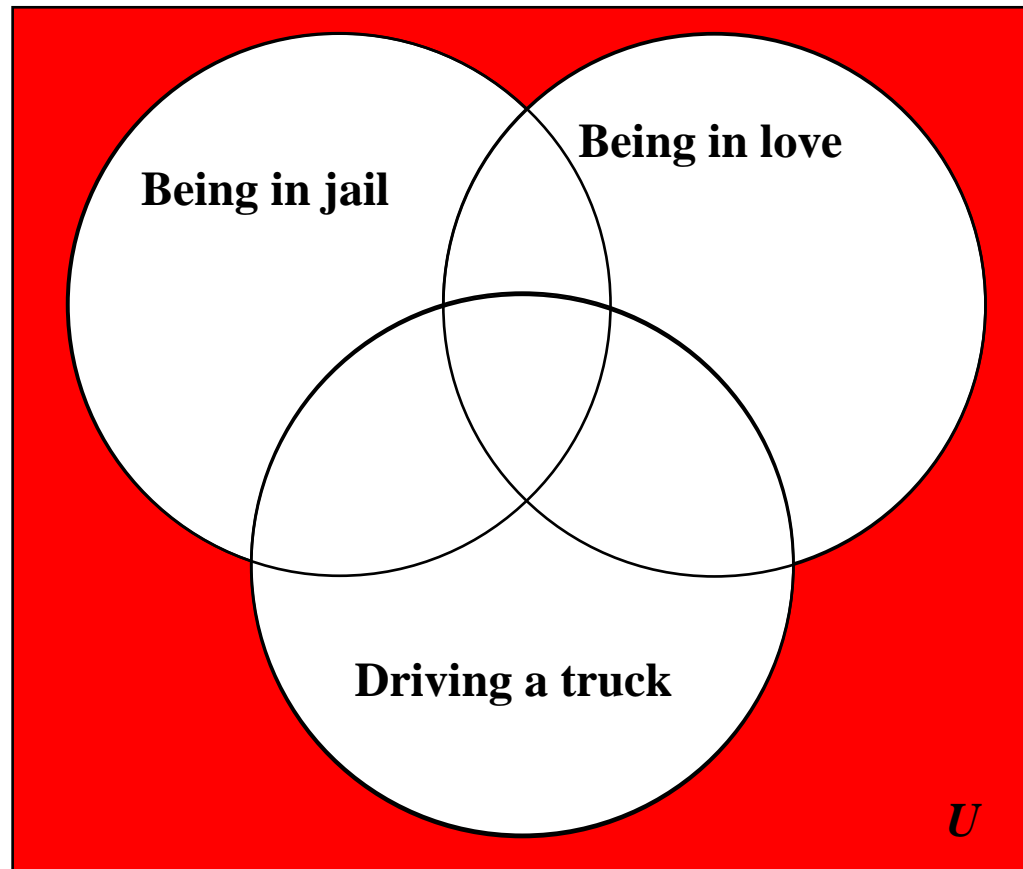**a) Complete the following Venn Diagram.**

Being in jail   Being in love

8   14   19

4

10   7

13   5

Driving a truck

U
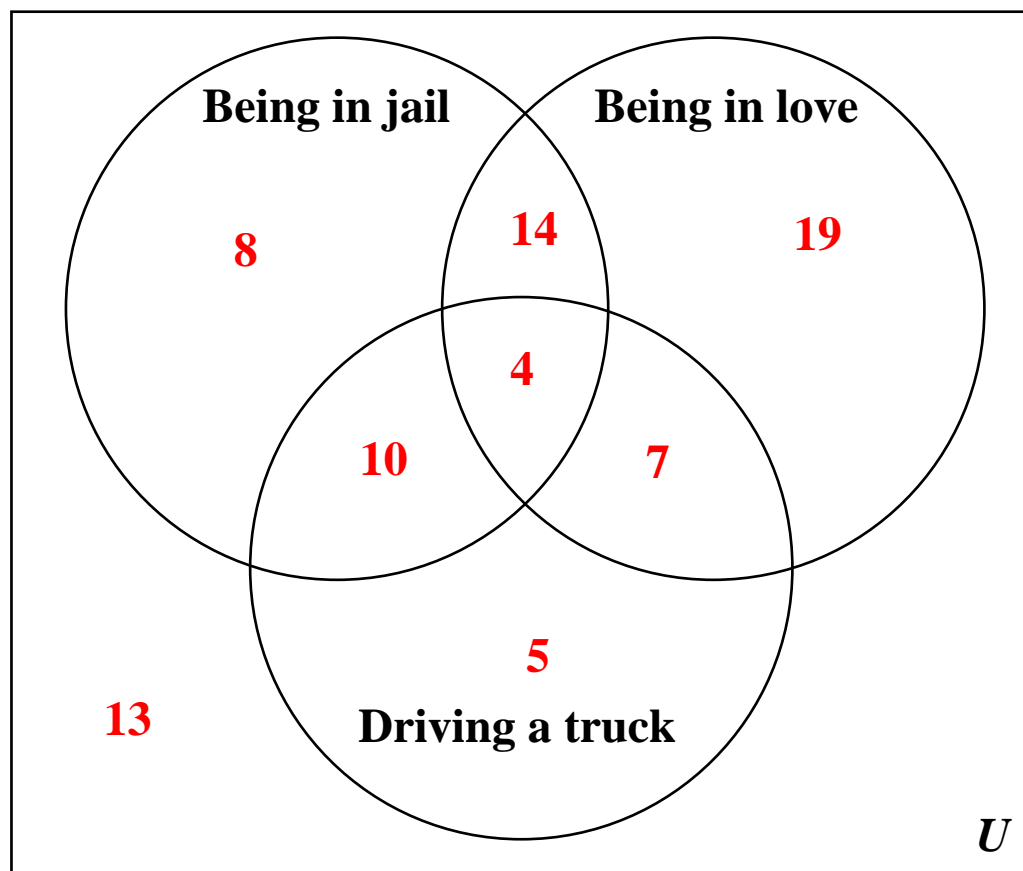
b) How many songs are about being in jail and driving a truck, but not being in love?
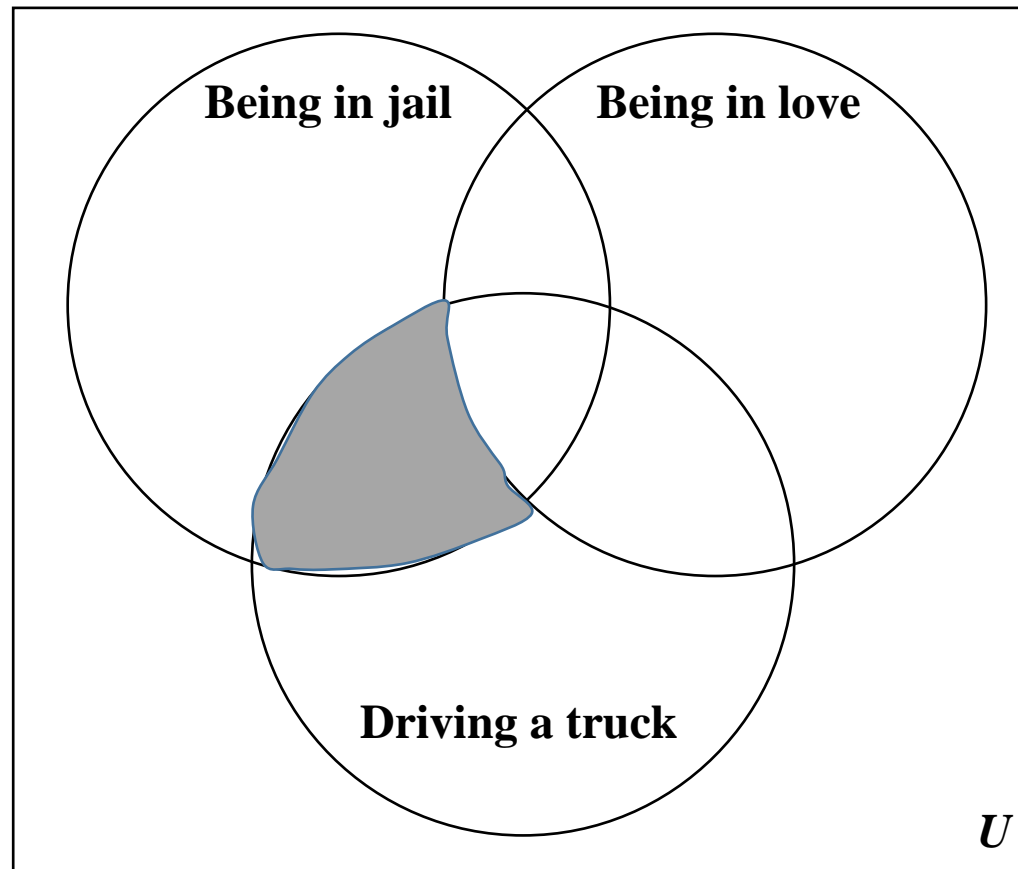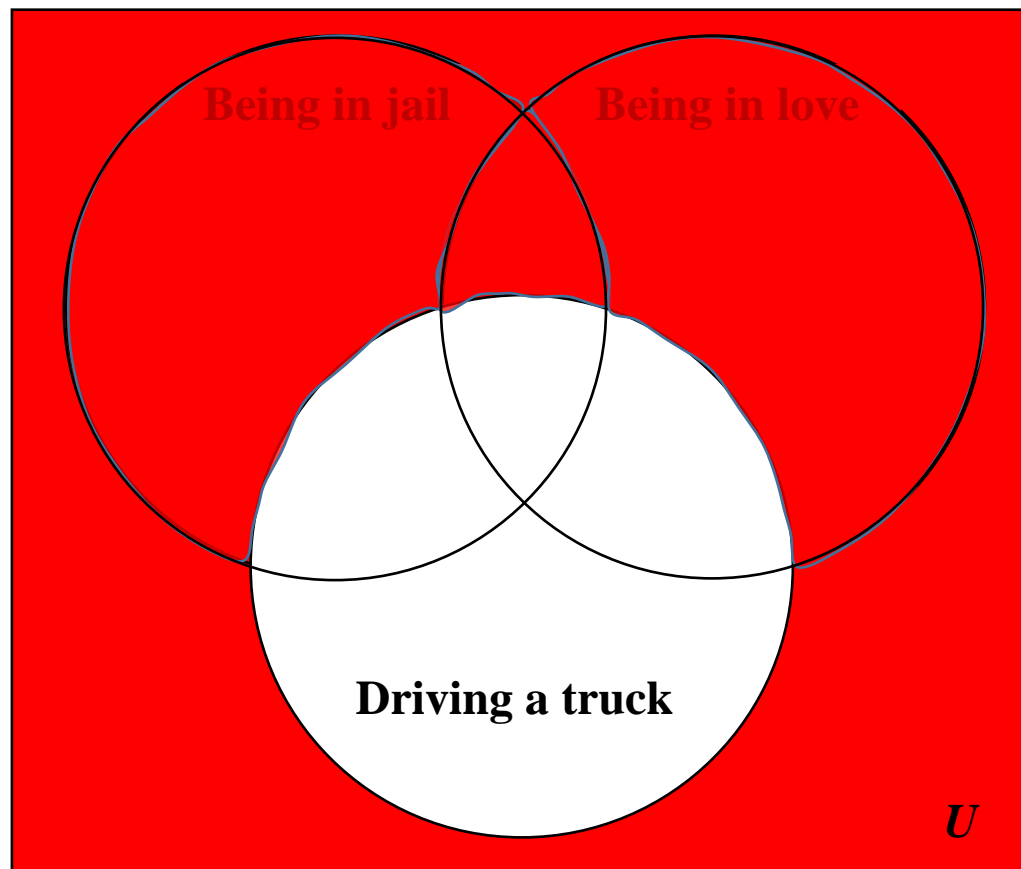
c) How many songs are only about driving a truck?

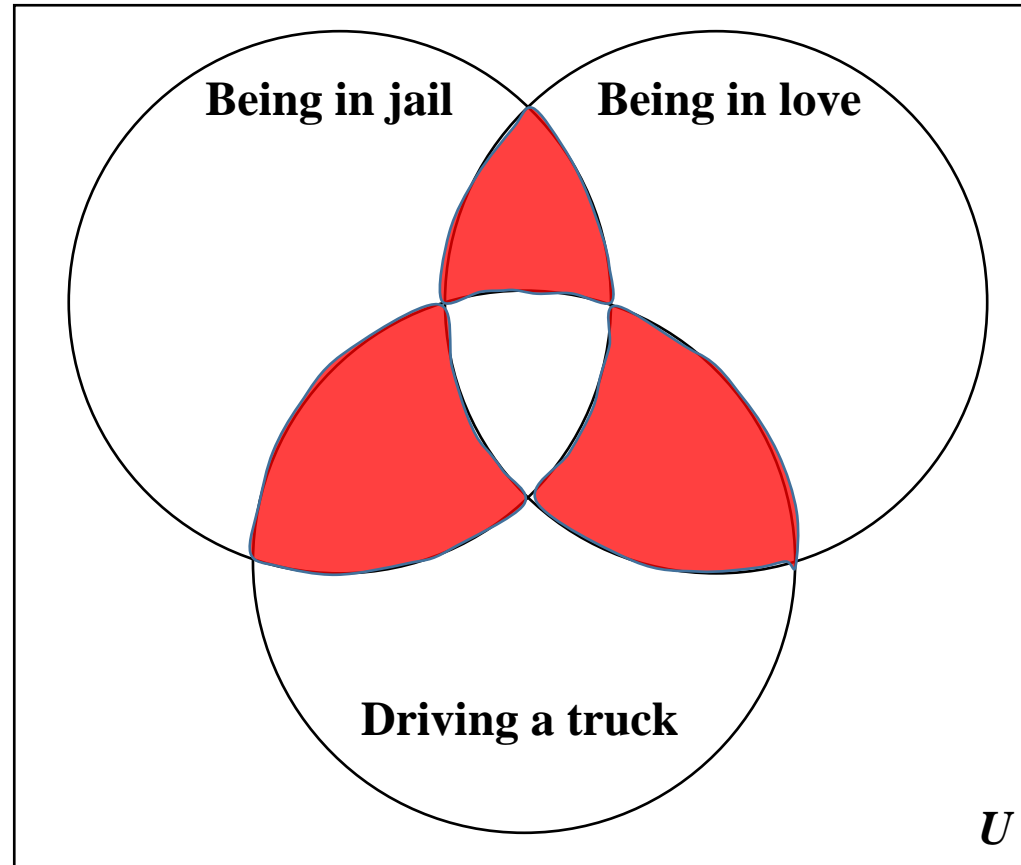**d) How many songs are not about being in jail or being in love, or driving a truck?**

e) How many songs are not about driving a truck?

Being in jail

Being in love

Driving a truck

U

$8 + 14 + 19 + 13 = \boxed{54}$ or $80 - 26 = \boxed{54}$

f) How many songs are about exactly two of the topics?

$$10 + 14 + 7 = \boxed{31}$$