

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

Dec. 30, 2005

There was a request from 1 fourth grade teacher here in Bristol for more practice with Venn diagrams.

With such an underwhelming minority of the teachers making this request, I felt I could not ignore the request.

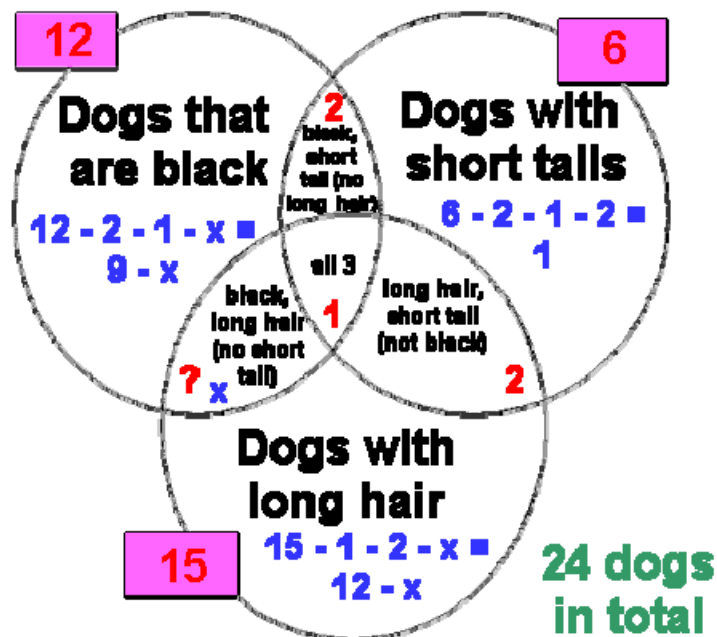
So to that teacher, I say, "Ask and ye shall receive. Here you go, toots! Venn away. Let me know if this packet helps you and if you have any questions about strategies, etc."

Here is an extra problem for anyone whose students don't need this packet of practice items:

Twenty-four dogs are in a kennel. Twelve of the dogs are black, six of the dogs have short tails, and fifteen of the dogs have long hair. There is only one dog that is black with a short tail and long hair. Two of the dogs are black with short tails and do not have long hair. Two of the dogs have short tails and long hair but are not black. If all of the dogs in the kennel have at least one of the mentioned characteristics, how many dogs are black with long hair but do not have short tails? "



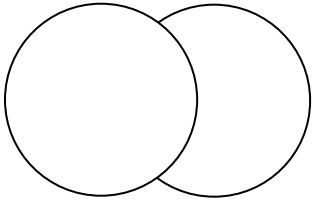
Solution: Draw a Venn diagram to represent the situation described in the problem. Represent the number of dogs that you are looking for with x.



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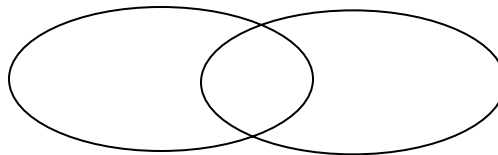
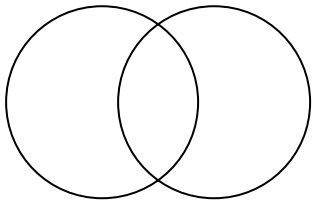
ONE WAY TO MAKE INTERSECTING VENN DIAGRAMS WITH A COMPUTER
(Microsoft Word 2003)

Below are the circles before I format them:



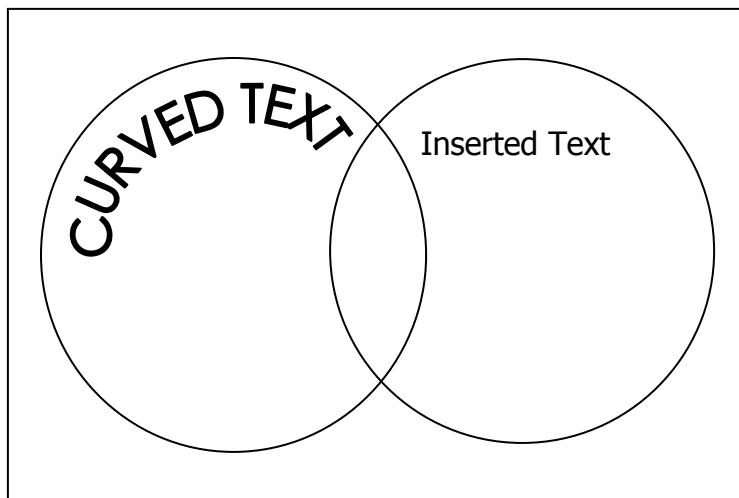
These are circles after I format them and make the transparency setting 100%

1. "Select" the circle
2. Go to "Format auto shape"
3. Click on "Colors and Lines"
4. Set "Transparency" setting to 100%.
5. Repeat for 2nd circle: Viola! 2 intersecting circles!



To add text, you could right click on a circle and click on "Insert Text" or you could use Word Art. I do both, depending on my mood and what I want.

If I want curved text, I use Word Art.

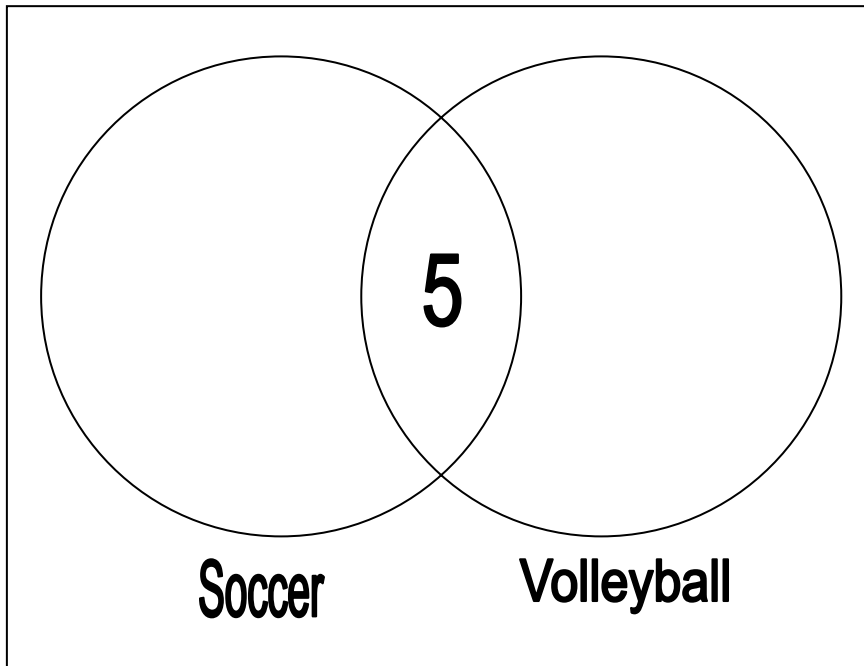


Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

Name _____ Date _____

At Ryan's school, a total of 29 students are on the soccer or volleyball teams.

- 5 of the 29 students play on **both** the soccer and volleyball teams as shown in the Venn diagram.
- There are a **total** of 14 students on the volleyball team.



Complete the Venn diagram above to show

- how many students play **only** soccer and
- how many students play **only** volleyball.

Show your work or explain how you found your answers.

Source: CMT Math Handbook – Part 2 at www.state.ct.us/sde

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

Name _____ Date _____

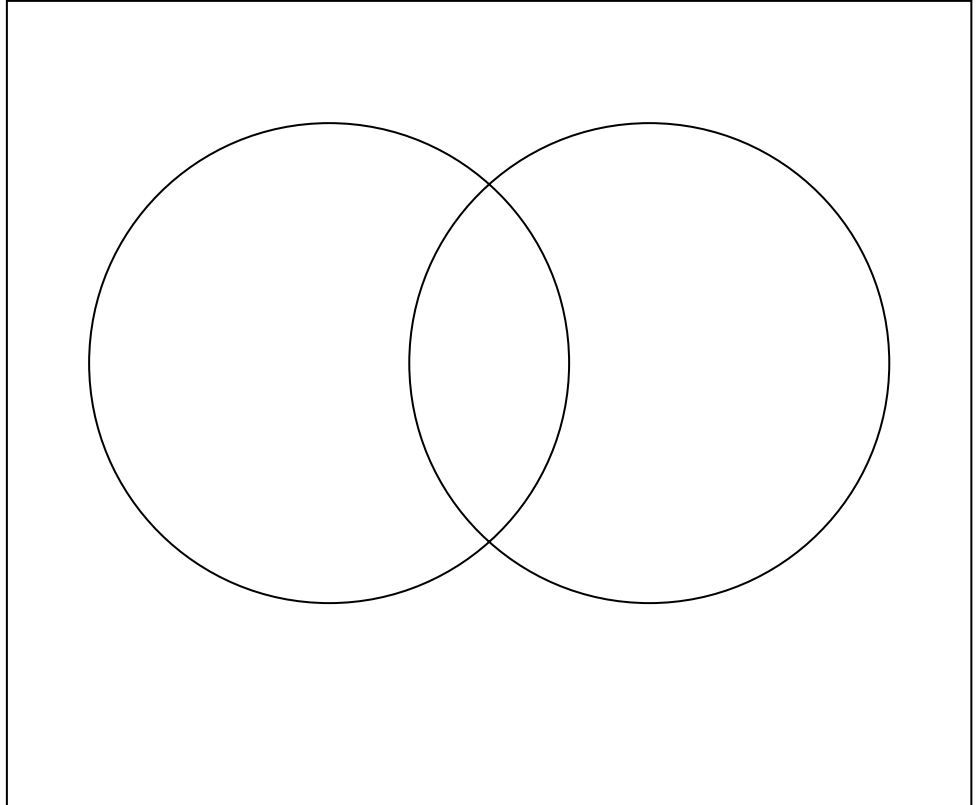
In Sonia's class, there are 23 students. One day:

- 5 students wore both a coat and a cap
- 4 did not wear a coat or cap
- 11 wore a coat
- 13 wore a cap

1. Fill in the Venn diagram.
2. Label the circles.
3. Answer the questions:

3a. How many children wore a coat but not a cap?

3b. How many children wore a cap but not a coat?



4. Show your work or explain how you found your answers.

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

Name _____ Date _____

The fourth grade took a poll of **25 students**.

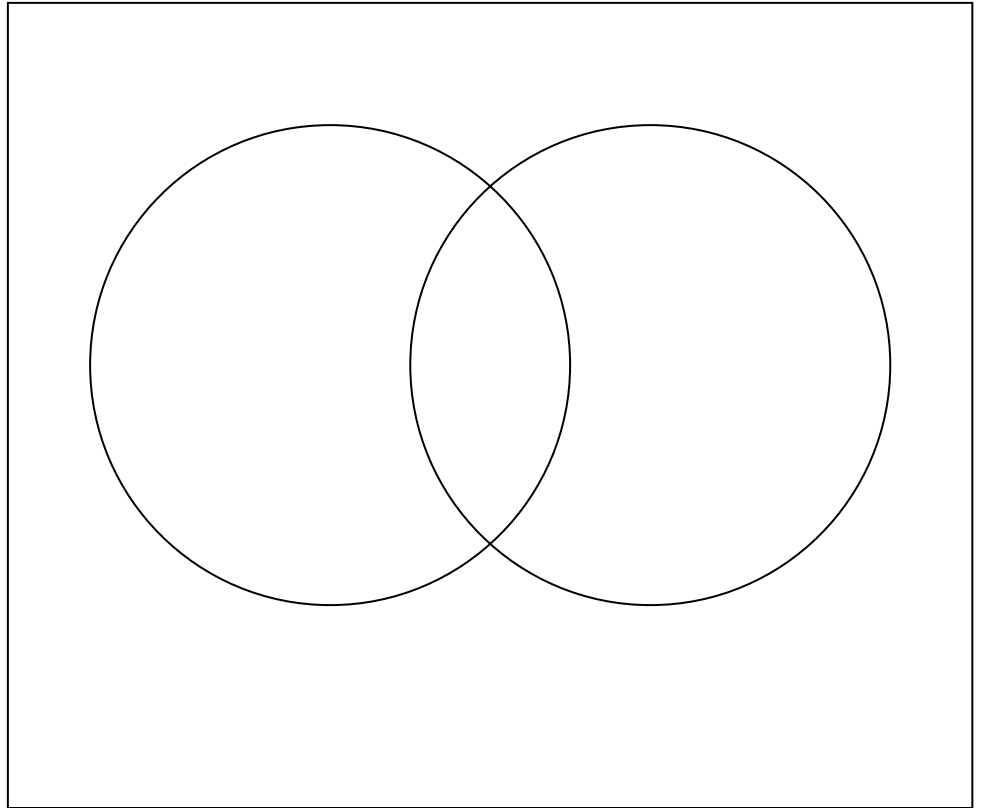
- 1 likes neither hamburger nor mushroom pizza
- 3 like both hamburger and mushroom pizza
- 16 like hamburger pizza
- 11 like mushroom pizza

~Fill in the Venn diagram.
~Label the circles.
~Answer the questions:

1. How many students like only hamburger pizza?

2. How many students like only mushroom pizza? _____

~Show your work or explain how you found your answers.



Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

Name _____ Date _____

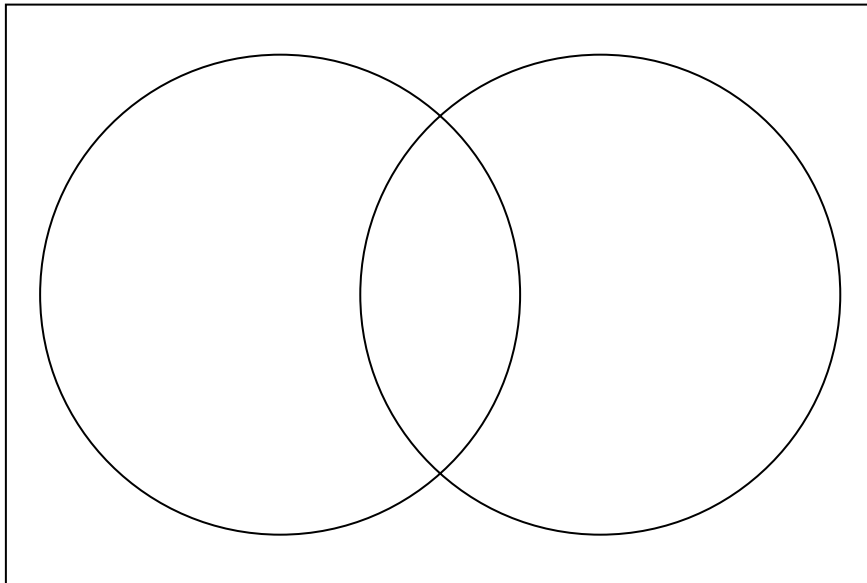
19 students were discussing sports they had played before kindergarten. They found out that

- 11 had played T-ball,
- 5 had played soccer, and
- 4 had not played either T-ball or soccer.

Label the circles.

Fill in the Venn diagram to answer these questions:

1. How many had played both T-ball and soccer? _____
2. Show your work or explain your answers.



Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

Name _____ Date _____

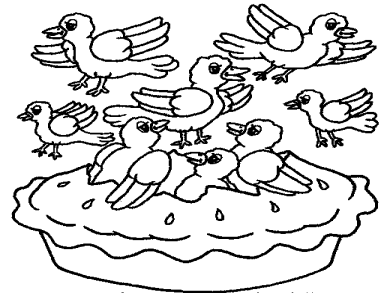
24 birds were baked in a pie.

When the pie was opened,

- 13 birds began to sing
- 8 birds sang and flew away
- 2 birds didn't fly or sing

Sing a song of sixpence,
A pocket full of rye;
Four and twenty blackbirds
Baked in a pie.

When the pie was opened,
The birds began to sing:
Wasn't that a dainty dish
To set before the king?



How many birds flew away?

Fill in the Venn diagram to answer the question.
Show your work or explain how you got your answer.

_____ BIRDS IN ALL

_____ birds did not sing or fly.

_____ birds sang.

_____ birds flew away.

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

Name _____ Date _____

There was an old woman who lived in a shoe.
She had so many children she did not know what to do.

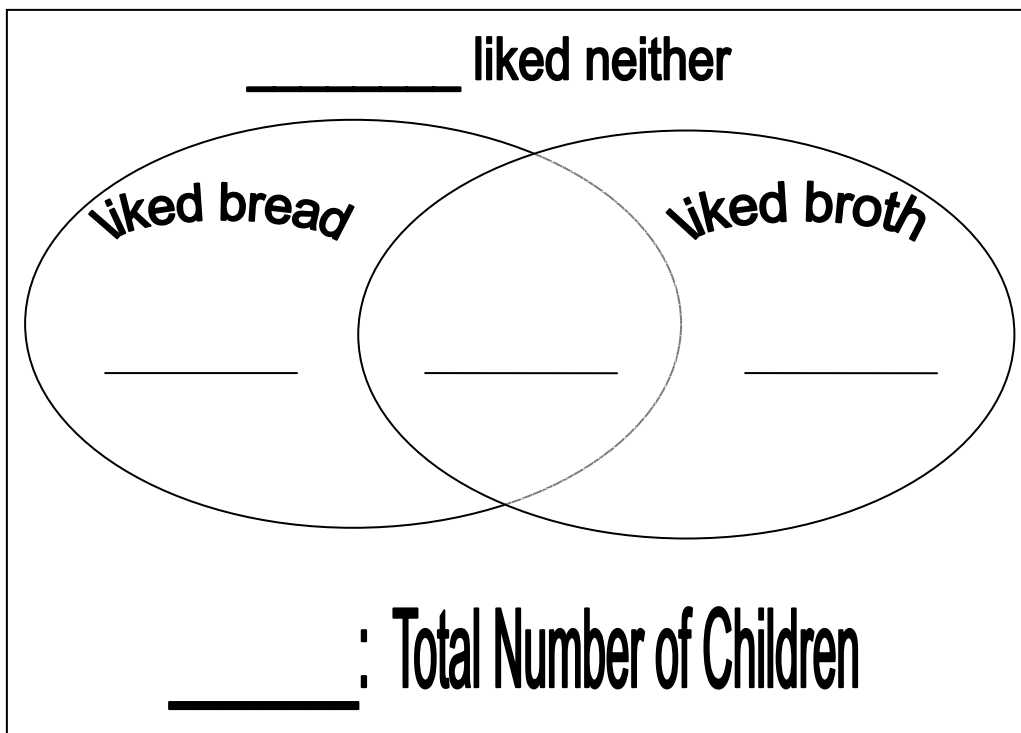
So she gave them some broth with lots of bread,
And kissed them all soundly, and sent them to bed.



The old woman in the shoe had

- ◆ 27 children who liked bread,
- ◆ 9 children who liked broth,
- ◆ 6 who liked both bread and broth, and
- ◆ 5 who liked neither bread nor broth. (They preferred pizza.)

How many children did the old woman have? Fill in the Venn diagram to answer the question.



Show your work or explain how you got your answers.

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

Name _____ Date _____

You have 19 blocks to sort.

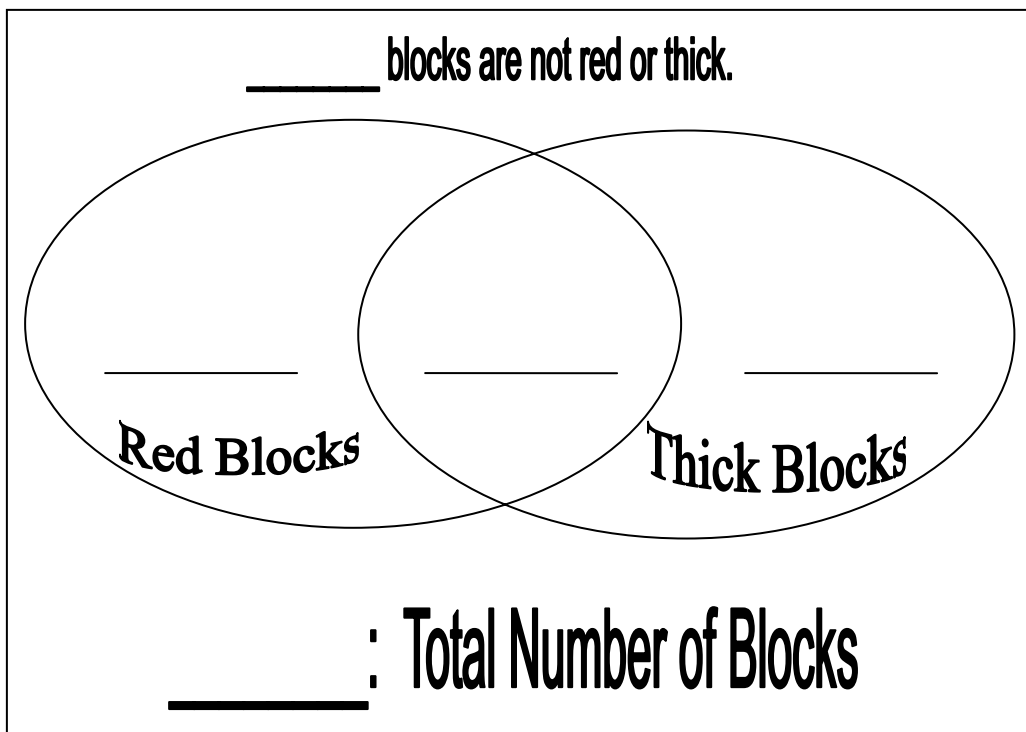
7 of the blocks are red, 11 of the blocks are thick, and 4 of the blocks are not red or thick.



How many of the blocks are thick **and** red? _____

Fill in the Venn diagram to answer the question.

Show your work or explain how you got your answer.

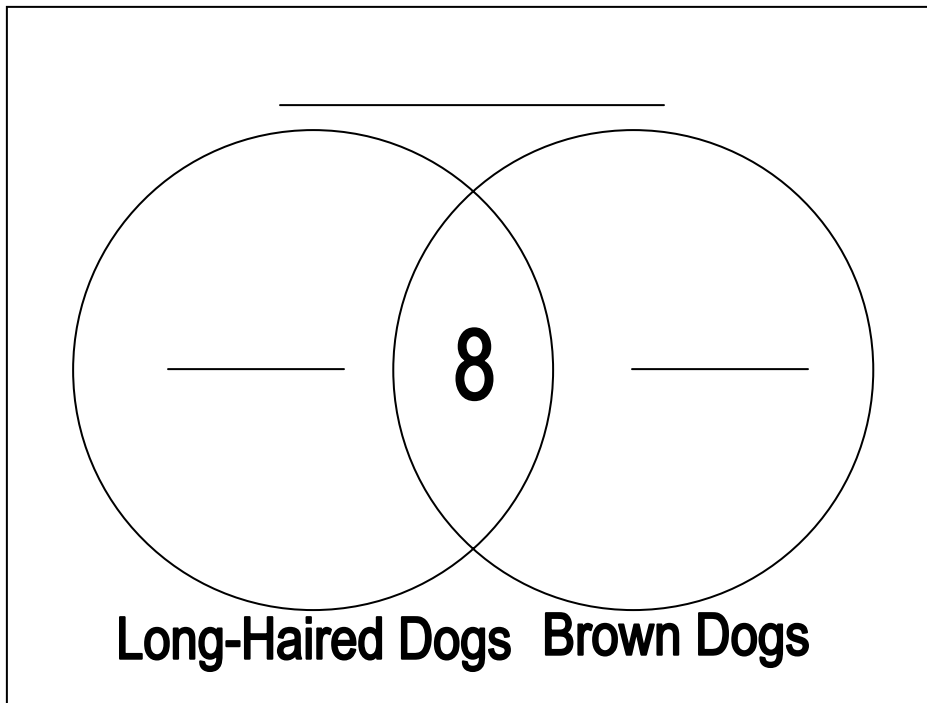


Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

Name _____ Date _____

Roberto counted 30 dogs at the animal shelter.

- 8 of the dogs are brown and have long hair as shown in the Venn diagram.
- There are a **total** of 18 dogs with long hair.
- There are 17 brown dogs in all.



Complete the Venn diagram above to show how many dogs are NOT brown and do NOT have long hair.

Show your work or explain how you got your answer.

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

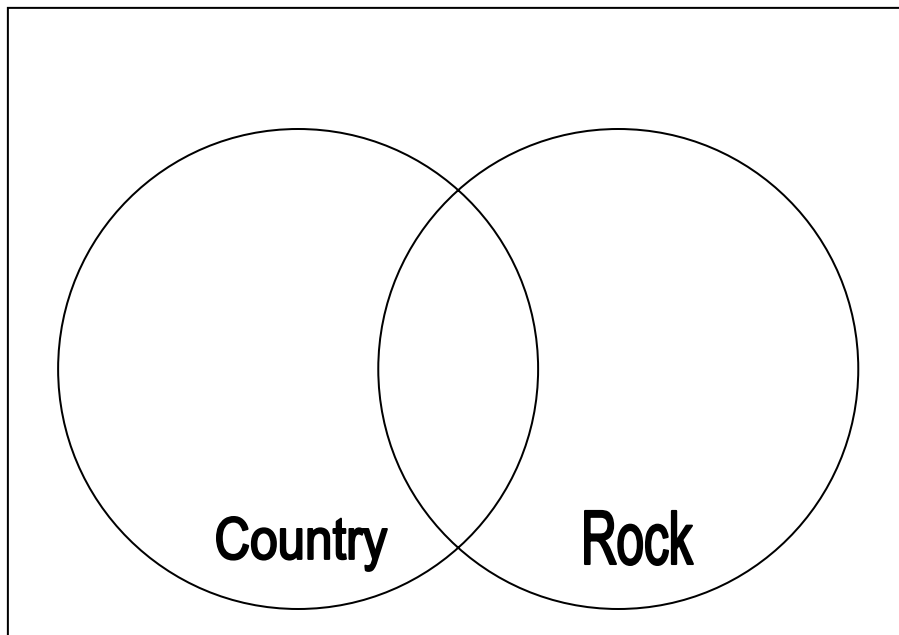
Name _____ Date _____

Mr. Dauphinee (Dau fin ā) made a Venn diagram to show two types of music his students liked.

- 17 students liked rock music.
- 14 students liked country music
- 3 students did not like rock or country music.
- 9 students liked both rock and country music.

How many students are in his class? _____

Fill in the Venn diagram to find your answer.
Show your work or explain how you got your answer



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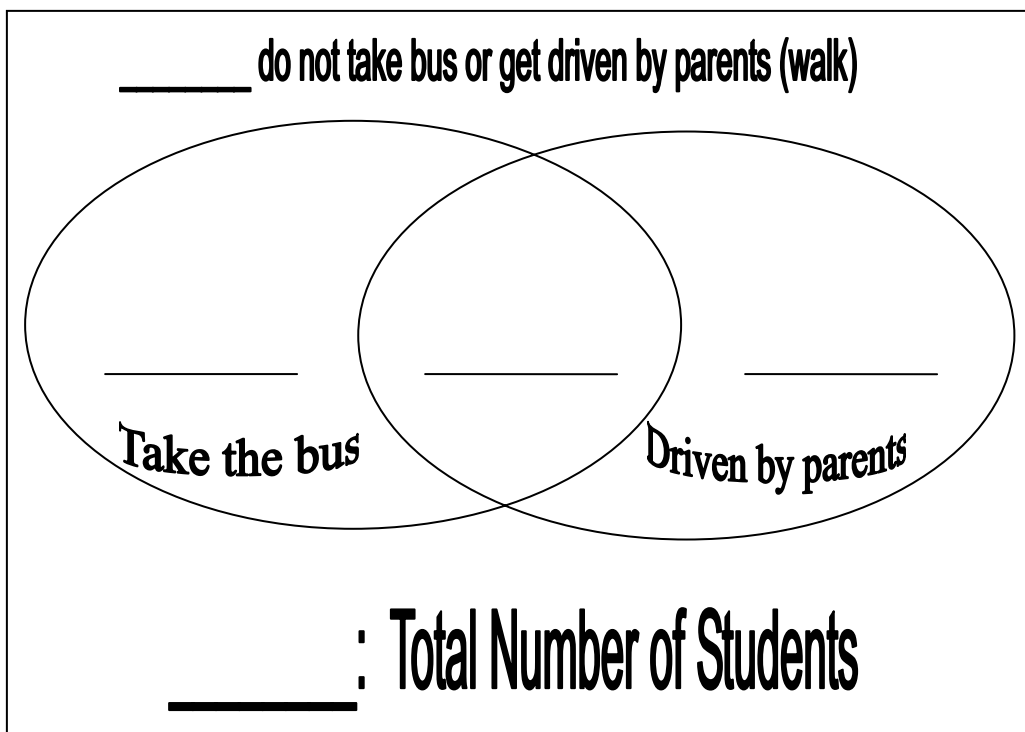
Name _____ Date _____

Mrs. Pendergast found out the following facts about the 24 students in her class:

- 13 students take the bus to school every day.
- 12 students are driven by their parents every day.
- 4 students take the bus some days and are driven by their parents other days.

How many students walk because they are NOT driven by car and do NOT take the bus to school? (They walk.) _____

Fill in the Venn diagram to find the answer.
Show your work or explain how you got your answer.



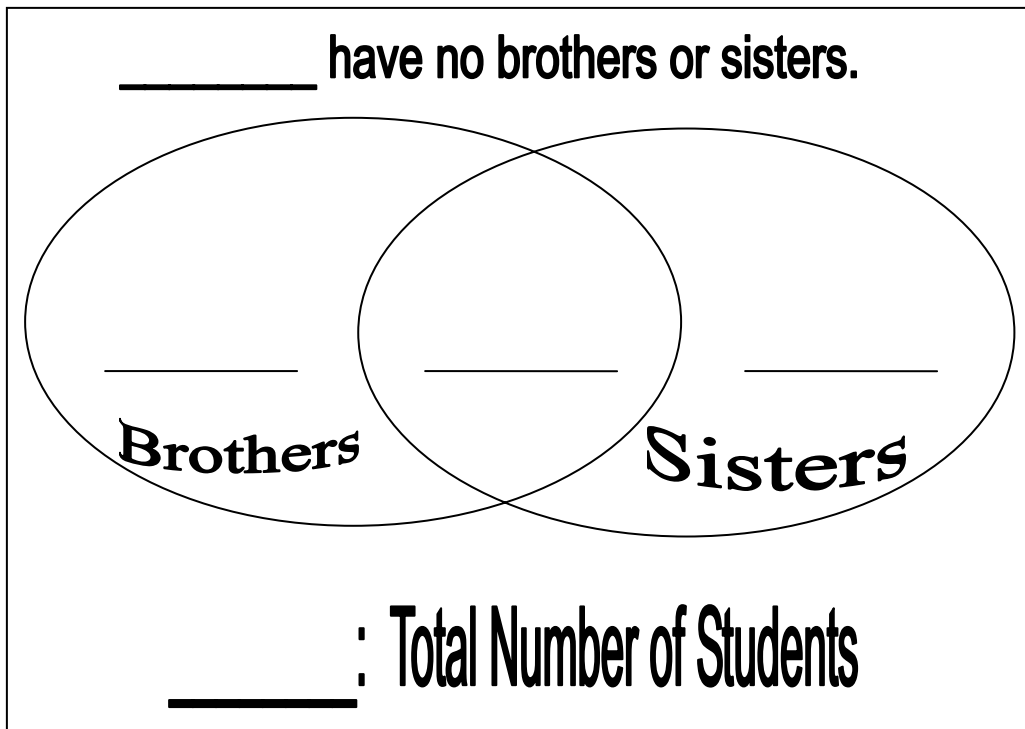
Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

Name _____ Date _____

Mrs. Madenjian (Mud en gee in) learned some interesting facts about the 26 students in her class. She found out that 10 children had only boys in the family, 14 children had only girls in the family, and 8 had both boys and girls in the family.

How many children had no brothers or sisters in the family? _____

Show your work or explain how you got your answer.



Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

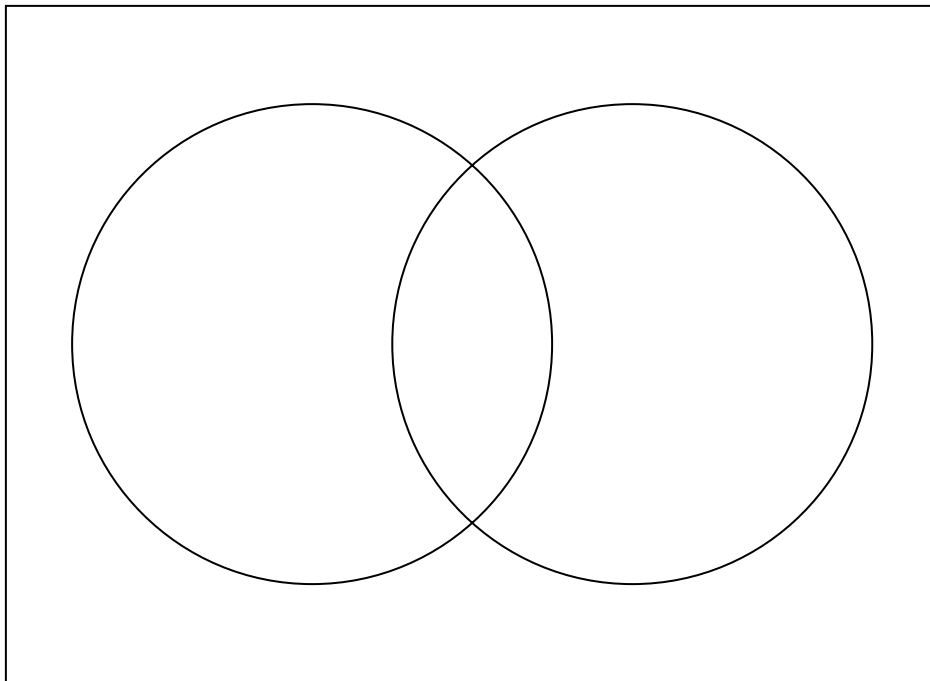
Name _____ Date _____

At Greene-Hills School, 60 fourth graders filled out the Venn diagram to see how many students listen to a radio or the TV when they do their homework.

- 15 students listen only to the radio.
- 25 students listen only to the TV.
- 20 students listen to the radio some days and TV other days.

How many students do not listen to a radio or the TV when doing homework? _____

Use the Venn diagram to find your answer.
Show your work or explain how you got your answer.

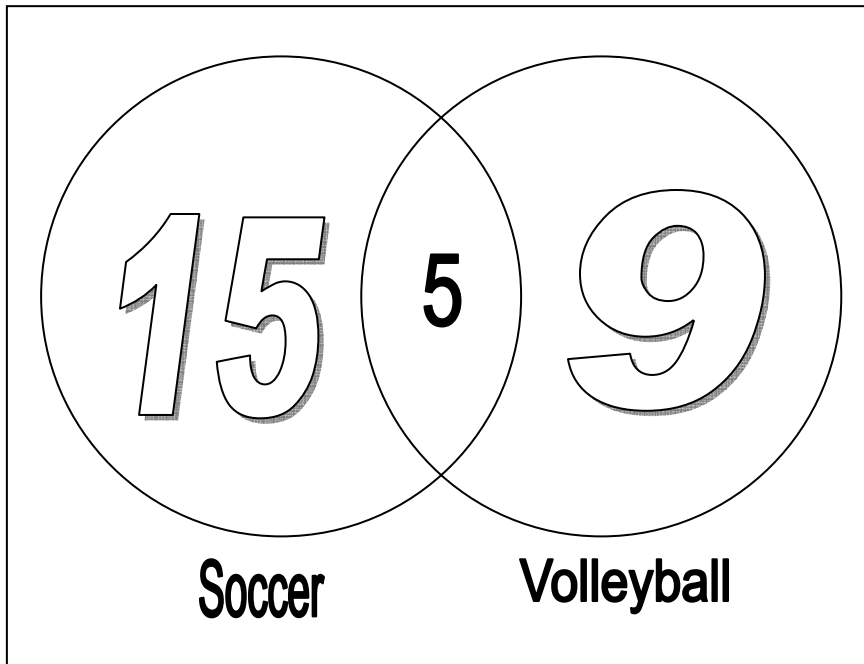


Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

ANSWERS

At Ryan's school, a total of 29 students are on the soccer or volleyball teams.

- 5 of the 29 students play on **both** the soccer and volleyball teams as shown in the Venn diagram.
- There are a **total** of 14 students on the volleyball team.



Complete the Venn diagram above to show

- how many students play **only** soccer and
- how many students play **only** volleyball.

Show your work or explain how you found your answers.

Possible Solution:

Volleyball: 14 volleyball – 5 intersection = 9

Soccer: 29 total – (5 intersection + 9 volleyball) =
29 – 14 = 15 for soccer

Check that 15 + 5 + 9 = 29 (total students)

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

ANSWERS

In Sonia's class, there are 23 students. One day:

- 5 students wore both a coat and a cap
- 4 did not wear a coat or cap
- 11 wore a coat
- 13 wore a cap

1. Fill in the Venn diagram.
2. Label the circles.
3. Answer the questions:

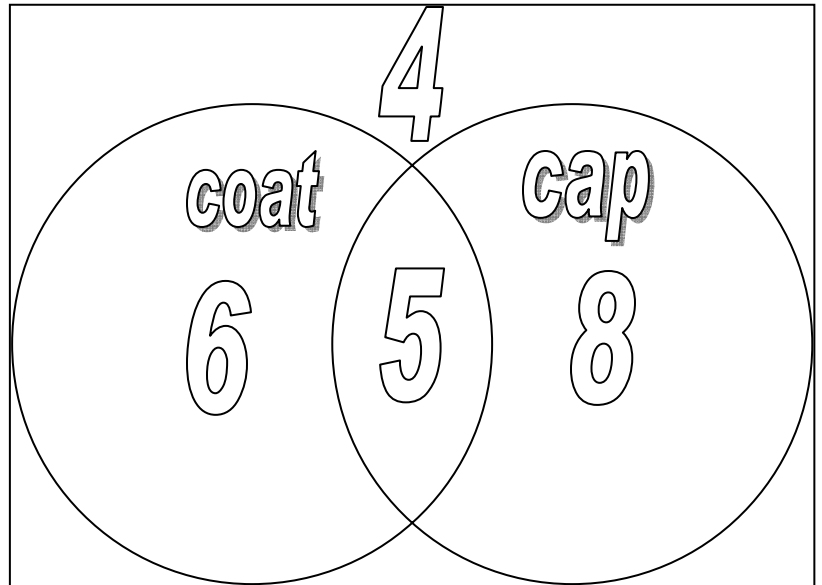
3a. How many children wore a coat but not a cap?

6

3b. How many children wore a cap but not a coat?

8

4. Show your work or explain how you found your answers.



Possible Solution

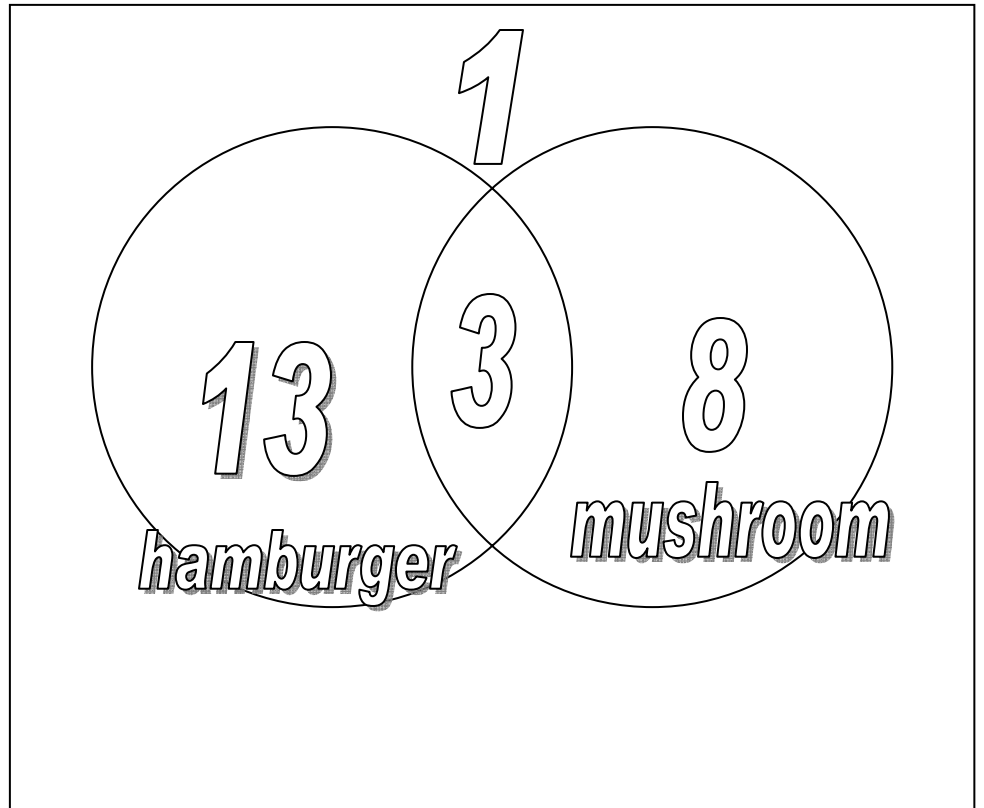
1. Label circles coat and cap
2. Write 5 in intersection (Bullet #1)
3. Write 4 outside circles (Bullet #2)
4. Coat: 11 coats – 5 intersections = 6 in coat circle (Bullet #3)
5. Cap: 13 caps – 5 intersections = 8 in cap circle (Bullet #4)
6. Check that $6 + 5 + 8 + 4 = 23$

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

ANSWERS

The fourth grade took a poll of **25 students**.

- 1 likes neither hamburger nor mushroom pizza
- 3 like both hamburger and mushroom pizza
- 16 like hamburger pizza
- 11 like mushroom pizza



~Label the circles.

~ Fill in the Venn diagram.

~Answer the questions:

1. How many students like only hamburger pizza?

13

2. How many students like only mushroom pizza?

8

~Show your work or explain how you found your answers.

Possible Solution

1. Label circles hamburger and mushroom (or hamburger pizza and mushroom pizza).

Bullet 1: Write 1 outside the circles

Bullet 2: Write 3 in intersection

Bullet 3: Hamburger = 16 – 3 (of intersection) = 13

Bullet 4: Mushroom = 11 – 3 (of intersection) = 8

Last: Check that $1 + 13 + 3 + 8 = 25$

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

ANSWERS

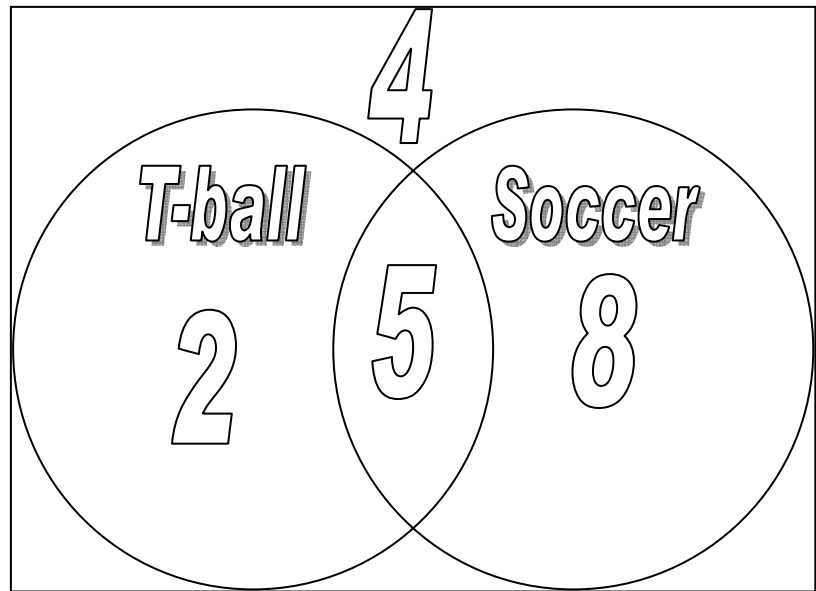
19 students were discussing sports they had played before kindergarten. They found out that

- 7 had played T-ball,
- 13 had played soccer, and
- 4 had not played either T-ball or soccer.

Label the circles.

Fill in the Venn diagram to answer these questions:

1. How many had played both T-ball and soccer? _____
2. Show your work or explain your answers.



First label circles T-ball and Soccer.

2nd, write 4 outside circles.

*3rd find out how much is left for 2 circles and intersection:
Subtract $19 - 4 = 15$*

4th fill in numbers for t-ball circle and soccer circle. "Guess and Check" may be a good strategy:

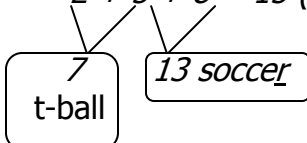
$$4 + 3 + 10 = 17 \text{ (too high - sum should be 15)}$$

\swarrow \swarrow
 7 13

$$3 + 4 + 9 = 16 \text{ (still too high but getting closer to 15)}$$

\swarrow \swarrow
 7 13

$$2 + 5 + 8 = 15 \text{ (YES!!)}$$



Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

ANSWERS

24 birds were baked in a pie.

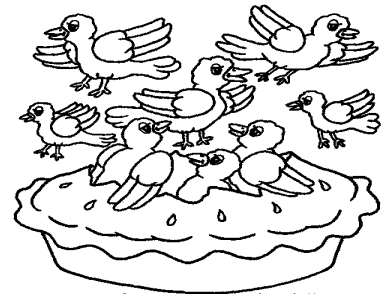
When the pie was opened,

- 13 birds began to sing
- 8 birds sang and flew away
- 2 birds didn't fly or sing

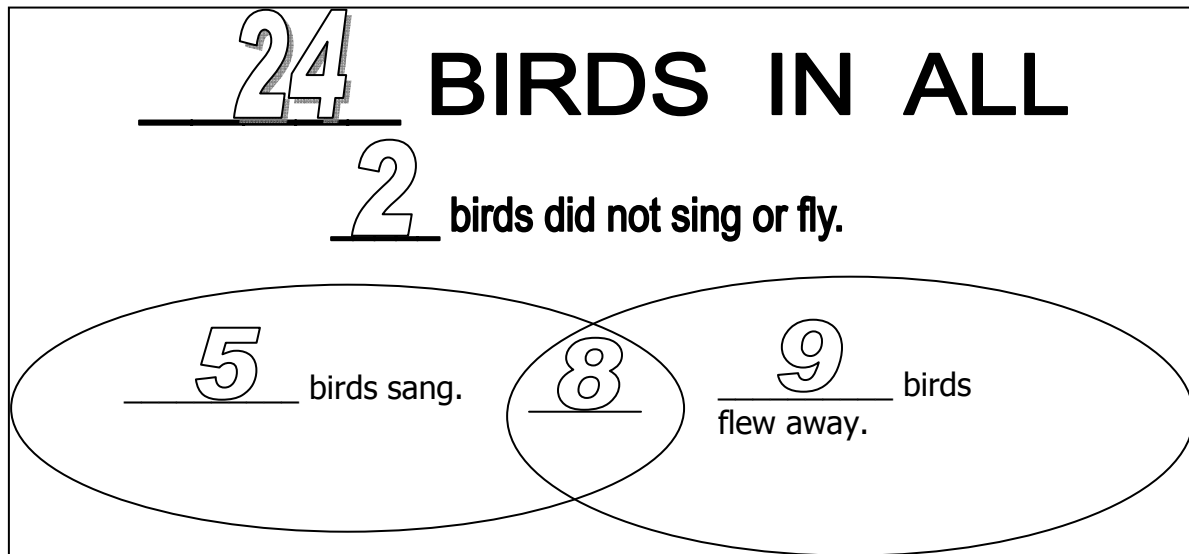
How many birds flew away?

Sing a song of sixpence,
A pocket full of rye;
Four and twenty blackbirds
Baked in a pie.

When the pie was opened,
The birds began to sing:
Wasn't that a dainty dish
To set before the king?



Fill in the Venn diagram to answer the question.
Show your work or explain how you got your answer.



POSSIBLE SOLUTION

1. Fill in "24" for "Birds in all"
2. Fill in "8" at Intersection of Circles (Bullet #2)
3. Fill in "2" for "birds did not sing or fly." (Bullet #3)
4. Find out total for both circles plus intersection: 24 in all – 2 not sing or fly = 22
5. Find out number of birds that only sang and number of birds that only flew away:

$$\underline{\quad} + 8 + \underline{\quad} = 22$$

$$22 - 8 = 14, \quad \text{so } \underline{\quad} + \underline{\quad} = 14$$

Try combinations that = 14 for the 2 missing numbers: $9 + 8 + 5 = 23$ (Almost 22, so adjust)
 $8 + 8 + 6 = 22$

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

ANSWERS

There was an old woman who lived in a shoe.
She had so many children she did not know what to do.

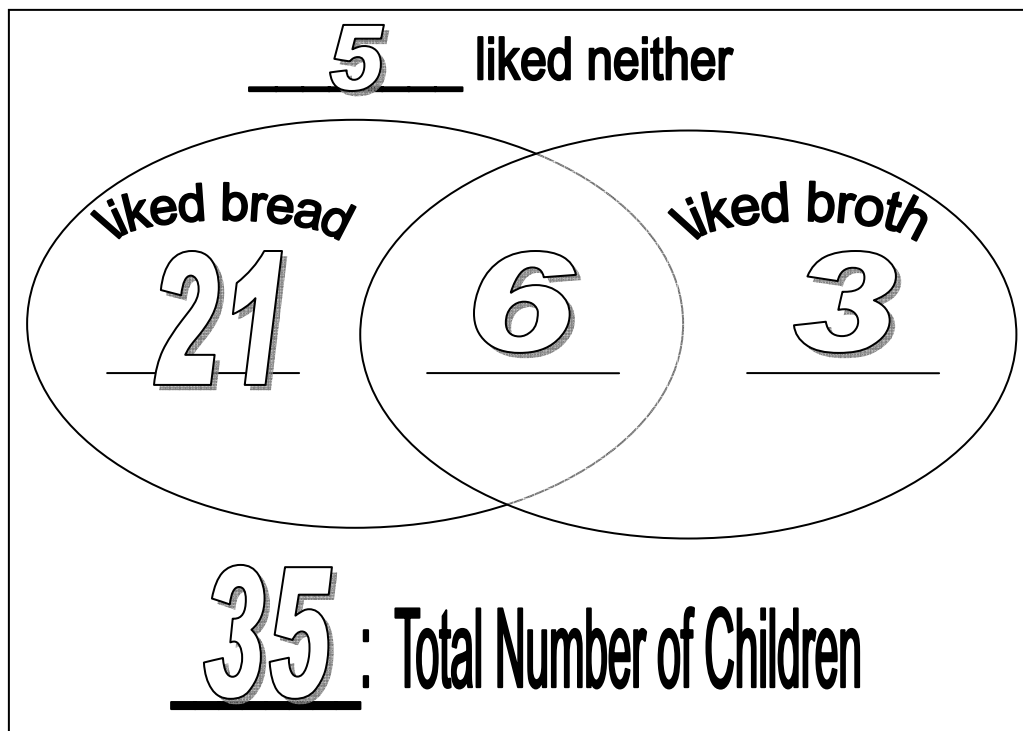
So she gave them some broth with lots of bread,
And kissed them all soundly, and sent them to bed.



The old woman in the shoe had

- ◆ 27 children who liked bread,
- ◆ 9 children who liked broth,
- ◆ 6 who liked both bread and broth, and
- ◆ 5 who liked neither bread nor broth. (They preferred pizza.)

How many children did the old woman have? Fill in the Venn diagram to answer the question.



Show your work or explain how you got your answers.

POSSIBLE SOLUTION

1. Fill in 6 at intersection (3rd bullet) and 5 at top (for liking neither bread nor broth)
2. Bread = 27 – 6 = 21 (1st bullet)
3. Broth = 9 – 6 = 3 (2nd bullet)
4. Total Number of Children = 5 + 21 + 6 + 3 = 35

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

ANSWERS

You have 19 blocks to sort.

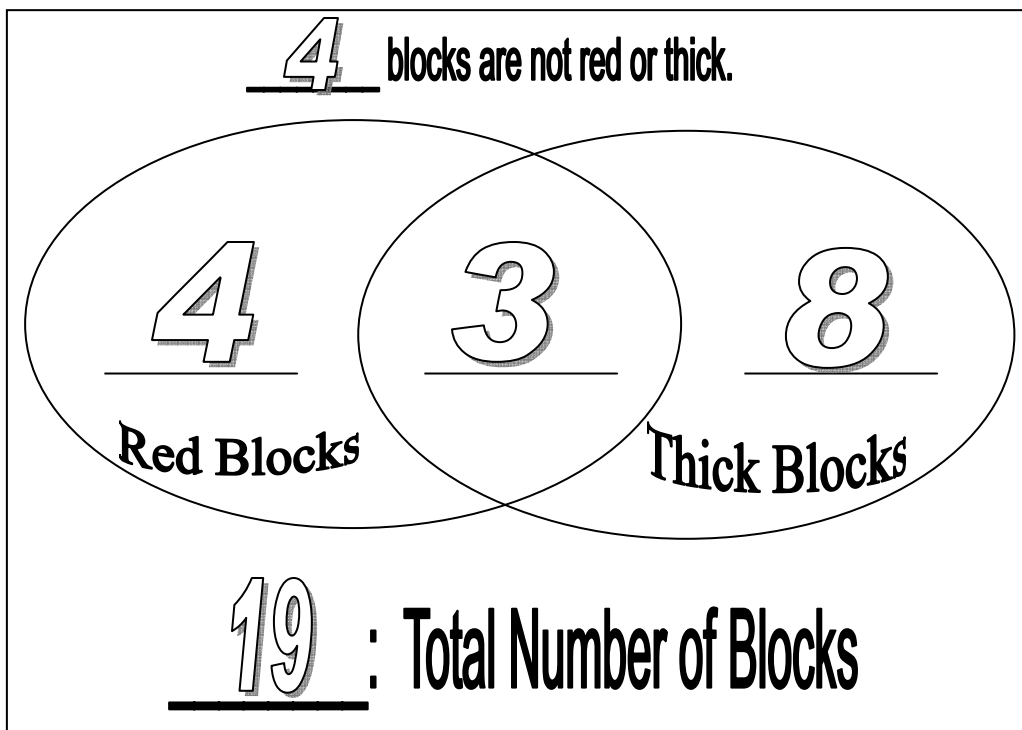
7 of the blocks are red, 11 of the blocks are thick, and 4 of the blocks are not red or thick.



How many of the blocks are thick **and** red? _____

Fill in the Venn diagram to answer the question.

Show your work or explain how you got your answer.



1. Add 10 blocks in one pile + 9 blocks in another pile = 19 blocks in all

2. Find total of Red Blocks + Intersection + Thick Blocks: $19 - 4 = 15$

2. $2 + \begin{array}{|c|} \hline 5 \\ \hline \end{array} + 6 = 13$, just 2 off from 15

3. $3 + \begin{array}{|c|} \hline 4 \\ \hline \end{array} + 7 = 14$; Now we are 1 away from 15

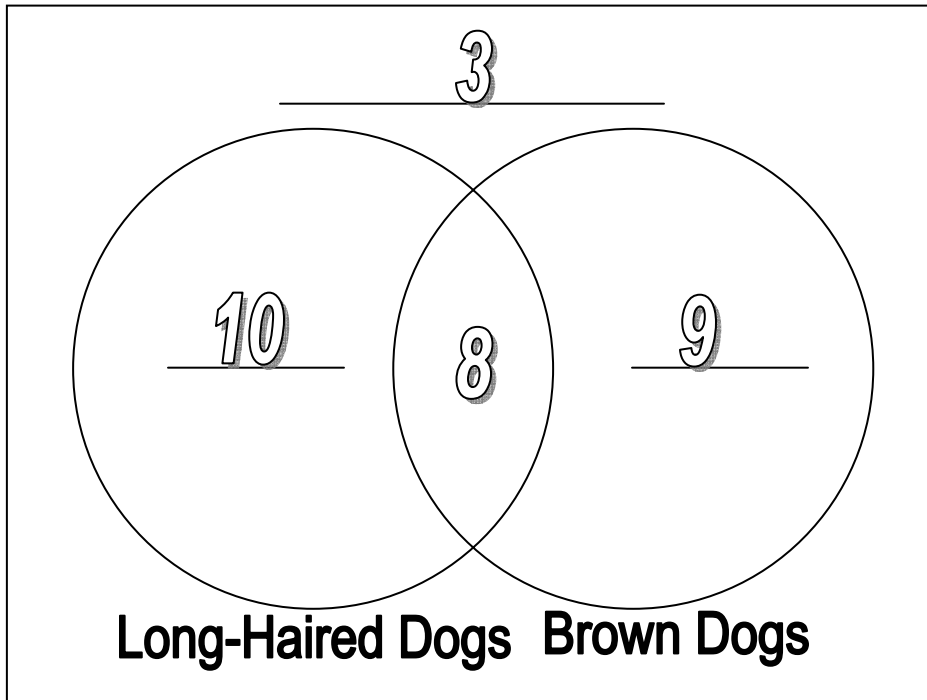
4. $4 + \begin{array}{|c|} \hline 3 \\ \hline \end{array} + 8 = 15$
 7 red 11 thick

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

ANSWERS

Roberto counted 30 dogs at the animal shelter.

- 8 of the dogs are brown and have long hair as shown in the Venn diagram.
- There are a **total** of 18 dogs with long hair.
- There are 17 brown dogs in all.



Complete the Venn diagram above to show how many dogs are NOT brown and do NOT have long hair.

Show your work or explain how you got your answer.

POSSIBLE SOLUTION

1. Write "8" in the intersection of the circles. (Bullet #1)
2. Find how many dogs only have long hair: $18 \text{ long-haired dogs} - 8 \text{ (intersection)} = 10$ (Bullet #2)
3. Find out how many dogs are brown: $17 \text{ brown dogs} - 8 \text{ (intersection)} = 9$ (Bullet #3)
4. Find out how many dogs are not brown and do not have long hair:
 $10 + 8 + 9 = 27$
 $30 \text{ dogs in all} - 27 = 3 \text{ dogs}$

Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

ANSWERS

Mr. Dauphinee (Dau fin ā) made a Venn diagram to show two types of music his students liked.

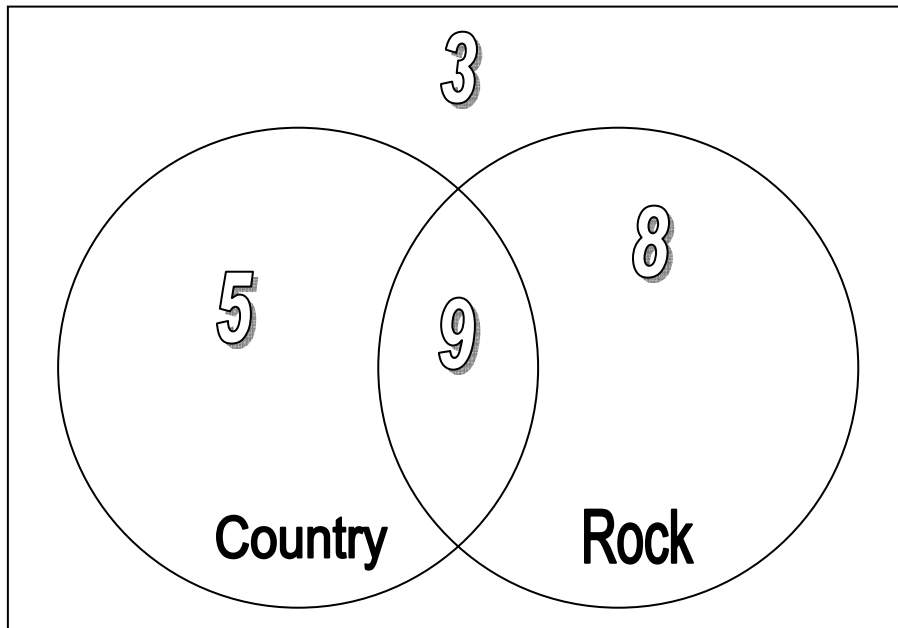
- 17 students liked rock music. **FOURTH: $17 - 9 = 8$**
- 14 students liked country music. **THIRD: $14 - 9 = 5$**
- 3 students did not like rock or country music. **COULD BE FIRST**
- 9 students liked both rock and country music. **COULD BE SECOND**

How many students are in his class? 25

LAST STEP: Add all 4 numbers ($5 + 9 + 8 + 3$)

Fill in the Venn diagram to find your answer.

Show your work or explain how you got your answer



Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

ANSWERS

Mrs. Pendergast found out the following facts about the 24 students in her class:

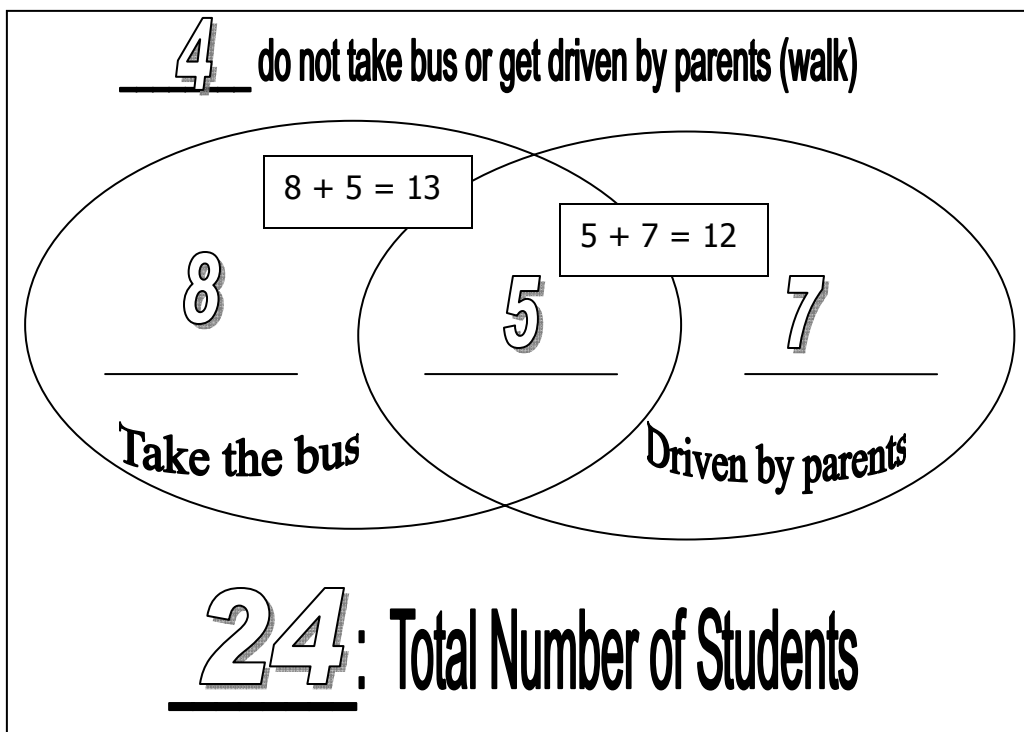
- 13 students take the bus to school every day.
- 12 students are driven by their parents every day.
- 4 students take the bus some days and are driven by their parents other days.

How many students walk because they are NOT driven by car and do NOT take the bus

to school? (They walk.) 4 $24 - (8 + 5 + 7) = 4$

Fill in the Venn diagram to find the answer.

Show your work or explain how you got your answer.



Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

TR

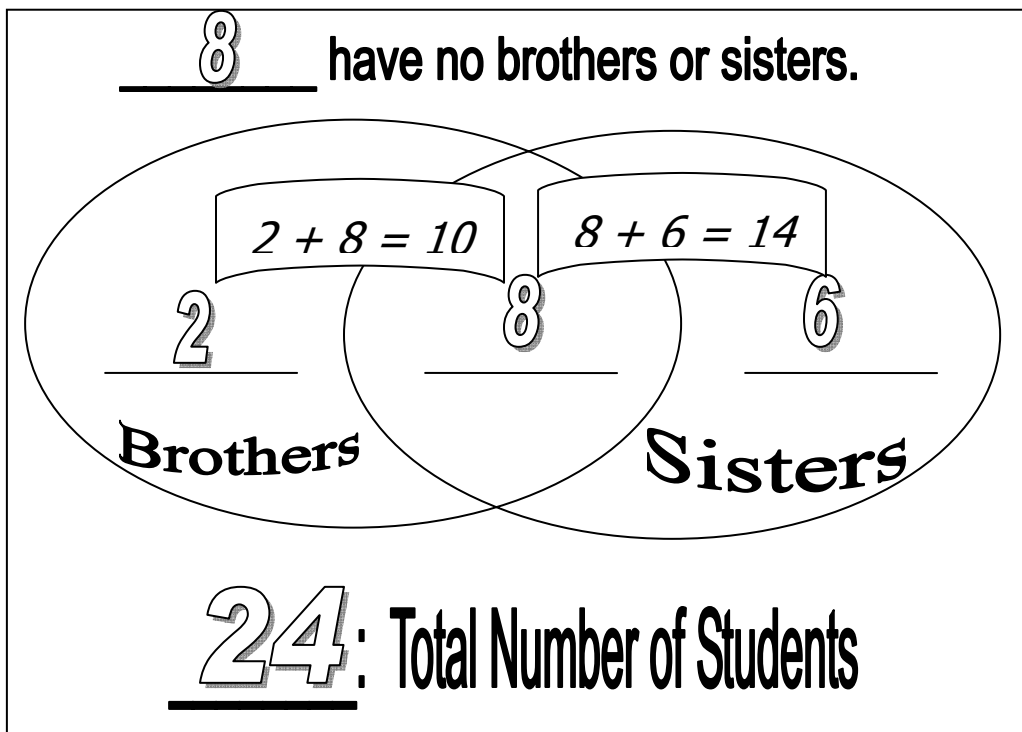
ANSWERS

Mrs. Madenjian (Mud en gee in) learned some interesting facts about the 26 students in her class. She found out that 10 children had only boys in the family, 14 children had only girls in the family, and 8 had both boys and girls in the family.

How many children had no brothers or sisters in the family? 8

$$24 - (2 + 8 + 6) = 8$$

Show your work or explain how you got your answer.



Grade 4 CMT (4th Gen) – Obj. 24B: ...Draw logical conclusions from data including Venn Diagrams.

ANSWERS

At Greene-Hills School, 60 fourth graders filled out the Venn diagram to see how many students listen to a radio or the TV when they do their homework.

- 37 students listen only to the radio.
- 25 students listen only to the TV.
- 20 students listen to the radio some days and TV other days.

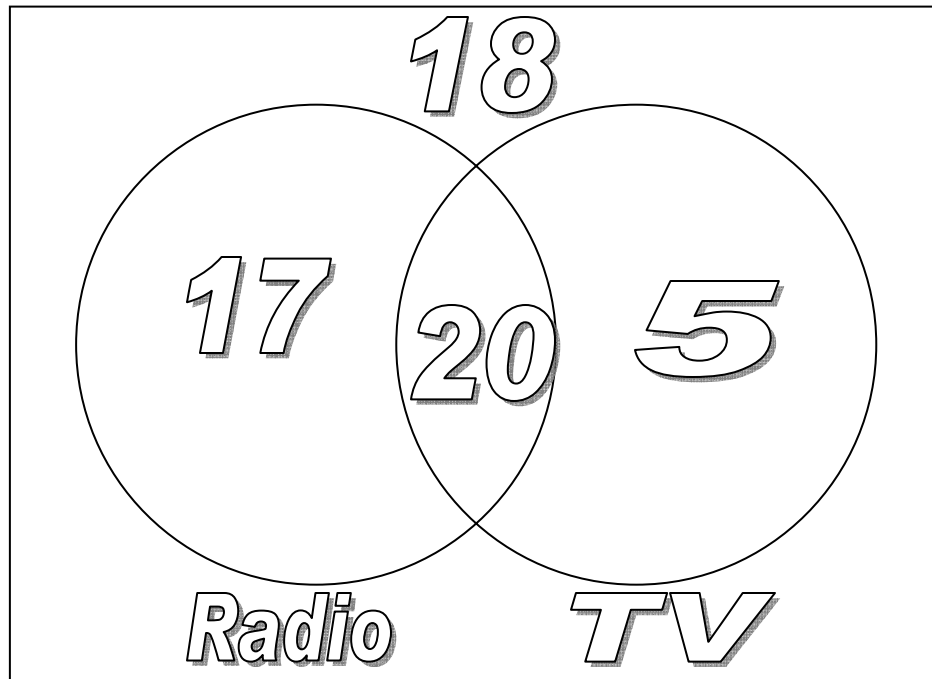
How many students do not listen to a radio or the TV when doing homework?

18

Use the Venn diagram to find your answer.

Label the circles.

Show your work or explain how you got your answer.



POSSIBLE SOLUTION

1. Label the circles.
2. Write "20" in the intersection.
3. Find the number for "TV" circle: $25 \text{ TV} - 20 \text{ intersection} = 5 \text{ in TV circle.}$
4. Find the number for "Radio" circle: $37 \text{ Radio} - 20 \text{ intersection} = 17 \text{ in Radio circle.}$
5. Find the number that belongs outside the circles and intersection:

$$17 + 20 + 5 = 42; \text{ Then } 60 - 42 = 18$$