GRADE 7 · UNIT 7 · LESSON 1

Circle Graphs

MA.7.DP.1.4

I can read a circle graph: what the whole is, what each sector's percent means, and how many each sector stands for.

Warm-Up

1. Scale 1 in. : 6 ft. A wall is 3.5 in. on the drawing. Real length?
2. Each student's favorite color: categorical or numerical data?
3. A full turn is 360°. How many degrees is $\frac{1}{12}$ of a full turn?
4. Find 25% of 80. Think: a quarter of 80.

Warm-Up

1. Scale 1 in. : 6 ft. A wall is 3.5 in. on the drawing. Real length?

   21 ft

2. Each student's favorite color: categorical or numerical data?

   Categorical

3. A full turn is 360°. How many degrees is $\frac{1}{12}$ of a full turn?

   $\frac{1}{12} \cdot 360 = 30$, **so 30°**

4. Find 25% of 80. Think: a quarter of 80. **20**

Vocabulary

circle graph

a circle cut into sectors that shows how one whole is split into categories; each sector is labeled with its category and a number — its percent or its count — and the graph has a title

sector

one slice of a circle graph: the part of the circle between two radii

the whole

everything the graph is about, such as all the students surveyed. The sectors together are the whole: 100%

percent

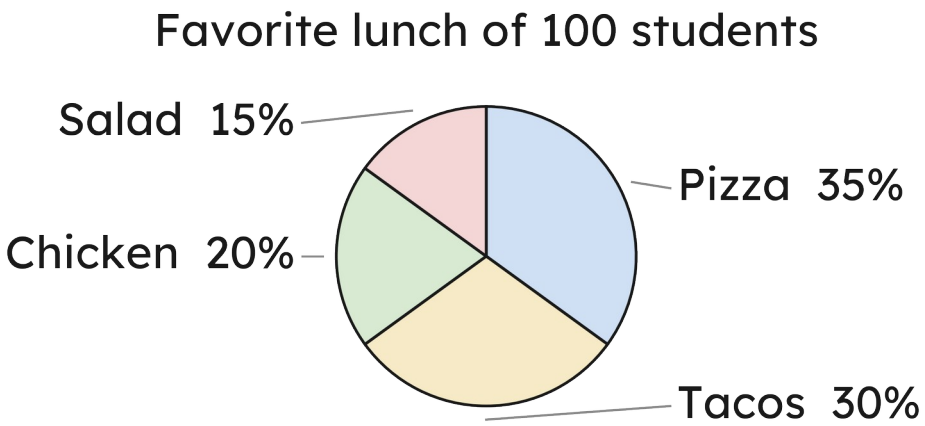
per hundred: 35% means 35 out of every 100, or 0.35

Notes

I. One whole, cut into sectors

100 students: each student is 1%. 35 of the 100 chose pizza: 35%.

The sectors together are the whole: $35 + 30 + 20 + 15 = 100$, so 100%.



Notes

II. From percent to count

A sector's count: its percent as a decimal, times the total.

Lunch	Percent	200 students	60 students
Pizza	35%	0.35 · 200 = 70	0.35 · 60 = 21
Tacos	30%	0.3 · 200 = 60	0.3 · 60 = 18
Chicken	20%	0.2 · 200 = 40	0.2 · 60 = 12
Salad	15%	0.15 · 200 = 30	0.15 · 60 = 9

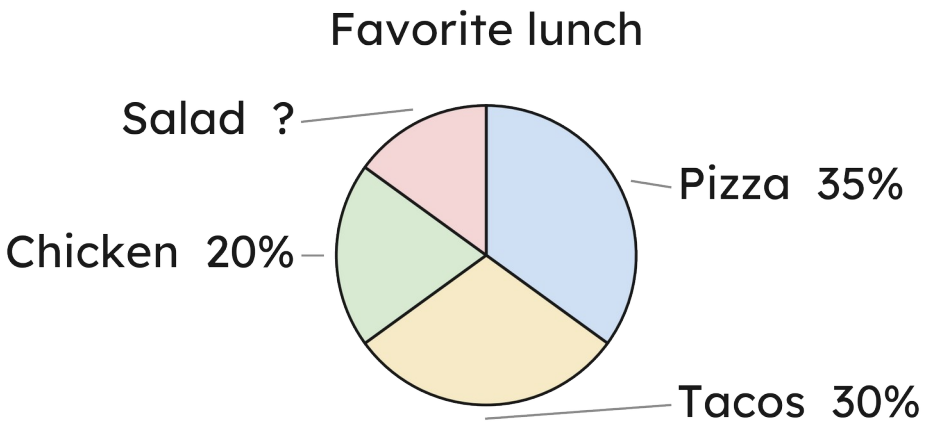
The percents stay the same; the counts change with the total.

Notes

III. What a missing sector must be

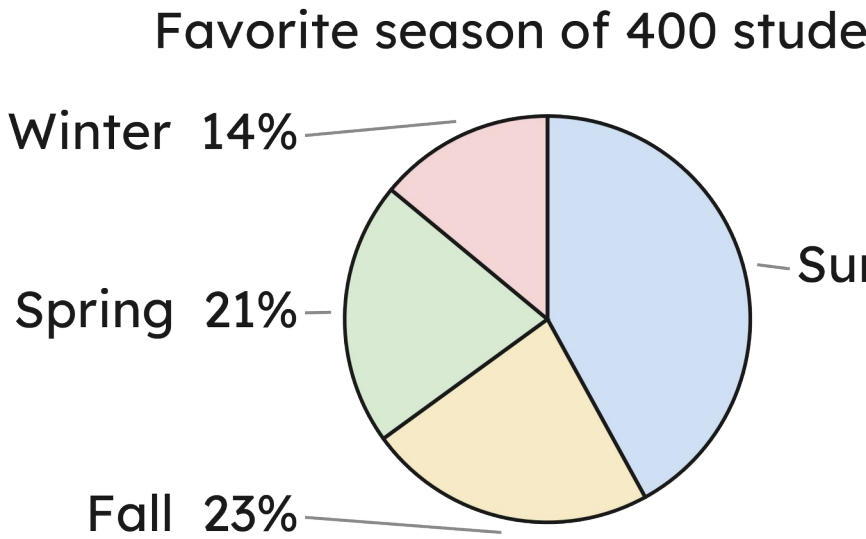
The sectors total 100%. Salad is not printed:

$100 - 35 - 30 - 20 = 15$, so Salad is 15%.



Example 1

A circle graph shows the favorite seasons of 400 students.



How many of the students chose fall?

Example 1

The whole: 400 students. Fall: 23% of them, as a decimal times the whole:

$$0.23 \cdot 400 = 92$$

Answer: 92 students chose fall.

Your Turn

A survey asked 300 students their favorite season:

Summer 36%, Spring 27%, Fall 25%, Winter 12%.

How many of the students chose spring?

Your Turn

A survey asked 300 students their favorite season:

Summer 36%, Spring 27%, Fall 25%, Winter 12%.

How many of the students chose spring?

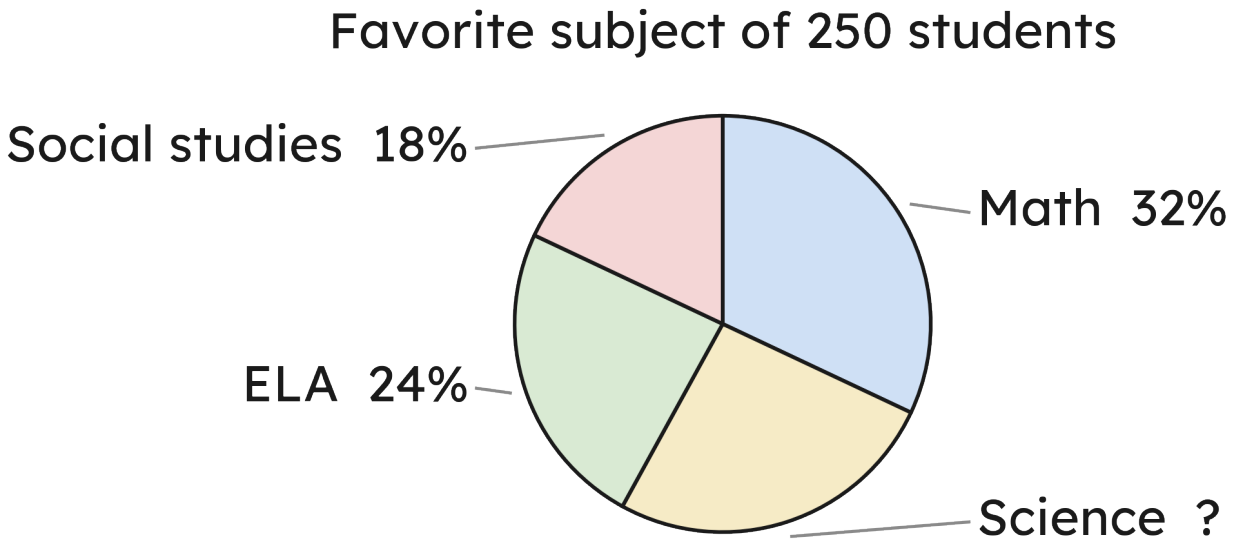
Spring: 27% of 300

$$0.27 \cdot 300 = 81$$

Answer: 81 students

Example 2

A circle graph shows the favorite subjects of 250 students.



What percent chose science? How many students is that?

Example 2

Science's percent: the sectors total 100%.

$$100 - 32 - 24 - 18 = 26$$

Science's students: 26% of 250.

$$0.26 \cdot 250 = 65$$

Answer: Science is 26%: 65 students.

Your Turn

A survey asked 150 students their favorite pet:

Dog 46%, Cat ?, Fish 12%, Bird 20%.

What percent chose cat? How many students is that?

Your Turn

A survey asked 150 students their favorite pet:

Dog 46%, Cat ?, Fish 12%, Bird 20%.

What percent chose cat? How many students is that?

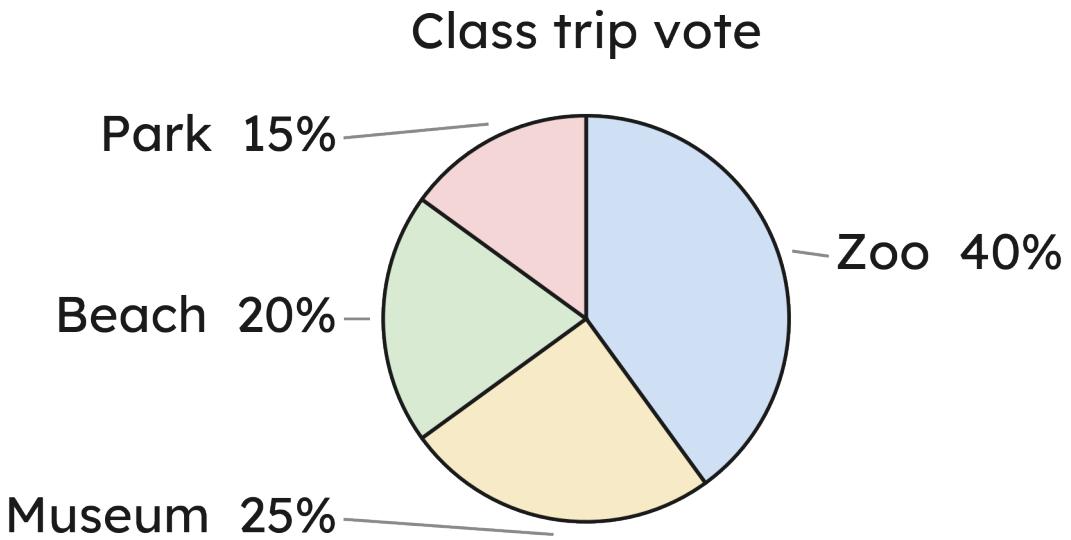
$100 - 46 - 12 - 20 = 22$, so 22%

$0.22 \cdot 150 = 33$

Answer: 22%: 33 students

Whiteboards · Question 1 of 9

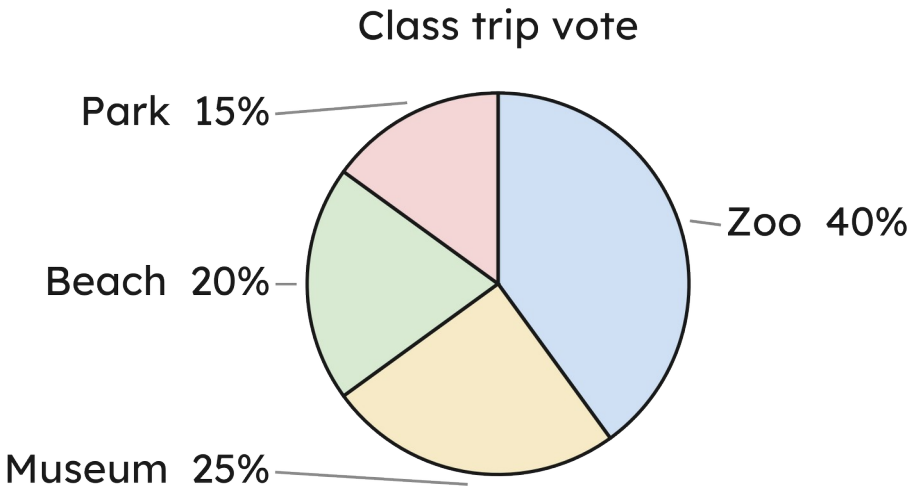
What percent of the students voted for the museum?



Answer it.

Whiteboards · Question 1 of 9

What percent of the students voted for the museum?

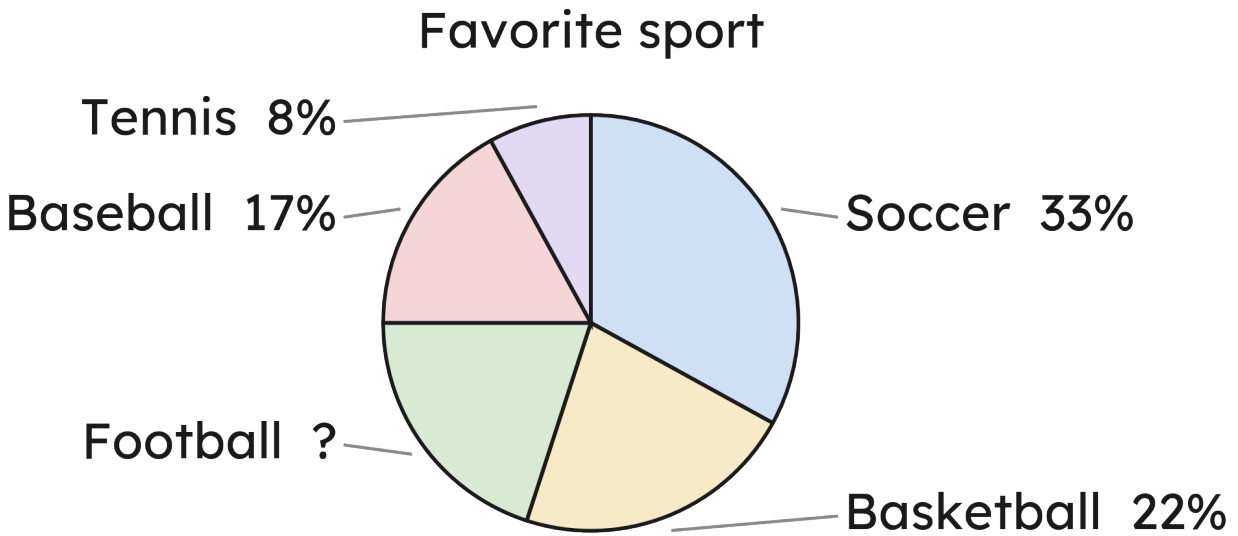


The museum's sector is labeled 25%

Answer: 25%

Whiteboards · Question 2 of 9

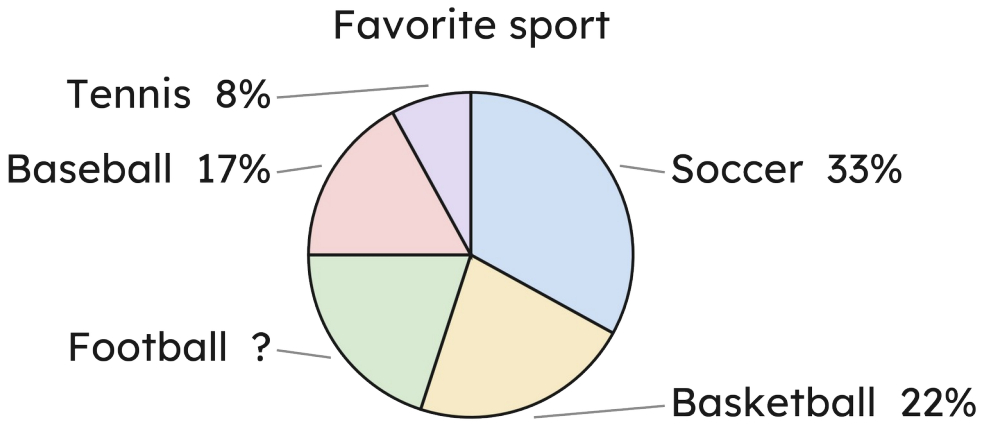
What percent of the students chose football?



Answer it.

Whiteboards · Question 2 of 9

What percent of the students chose football?



$100 - 33 - 22 - 17 - 8 = 20$

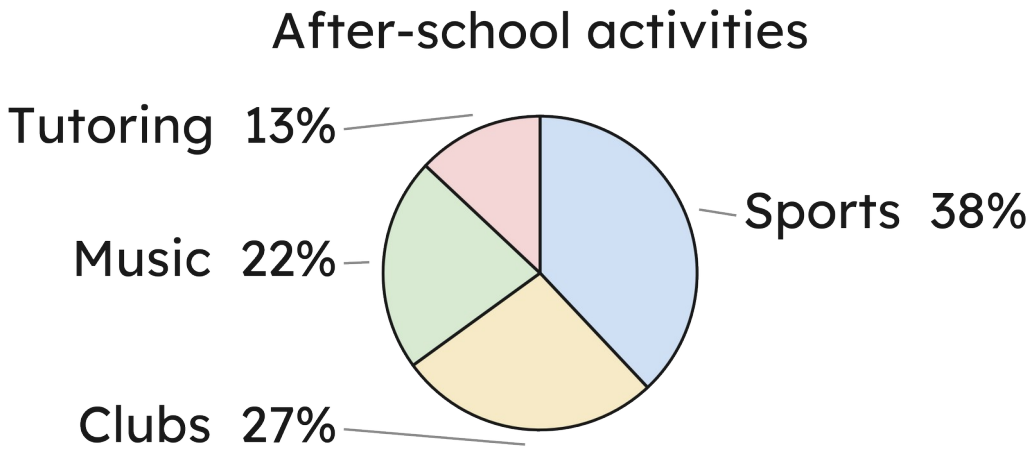
Check: $33 + 22 + 20 + 17 + 8 = 100$

Answer: 20%

Whiteboards · Question 3 of 9

The circle graph shows the after-school activities of 200 students.

How many of the students are in music?

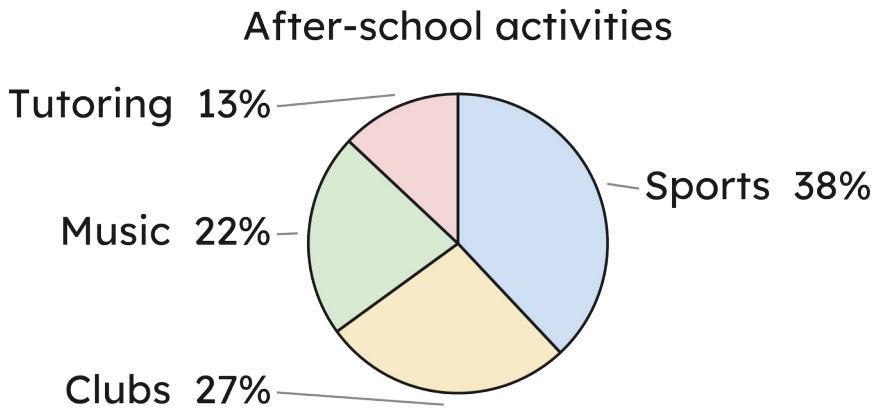


Answer it.

Whiteboards · Question 3 of 9

The circle graph shows the after-school activities of 200 students.

How many of the students are in music?



Music: 22% of 200

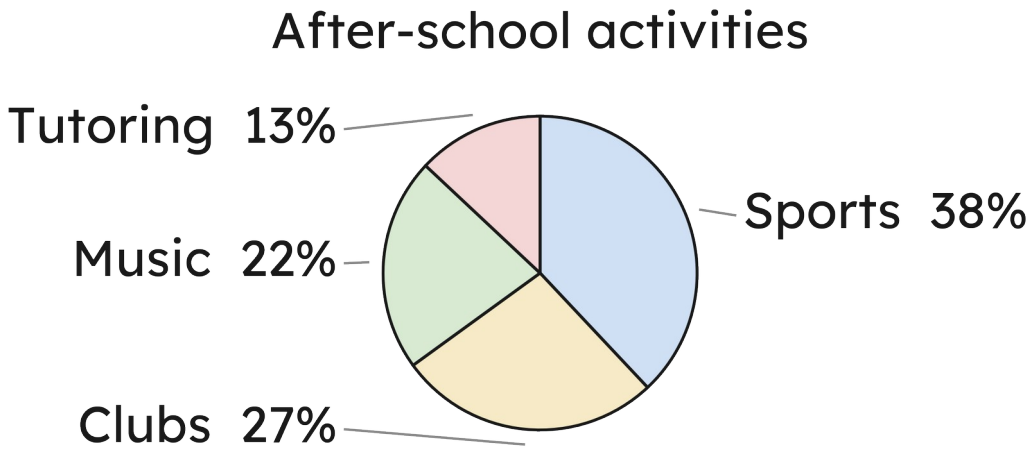
$0.22 \cdot 200 = 44$

Answer: 44 students

Whiteboards · Question 4 of 9

The same circle graph shows the activities of 600 students.

How many of these students are in music?

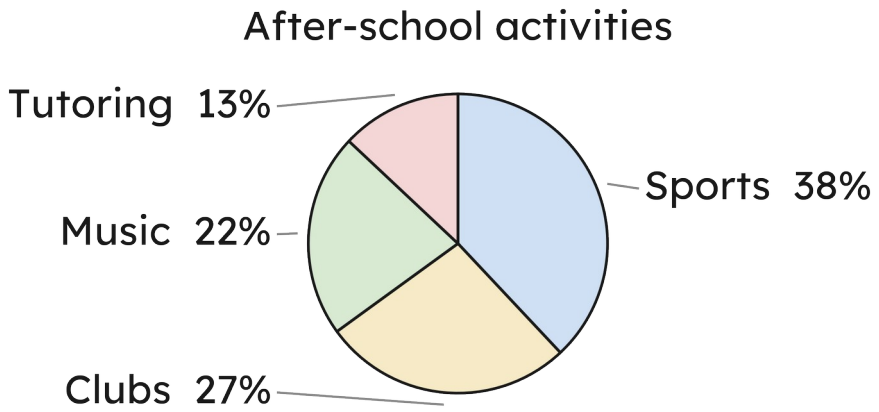


Answer it.

Whiteboards · Question 4 of 9

The same circle graph shows the activities of 600 students.

How many of these students are in music?



Music: 22% of 600

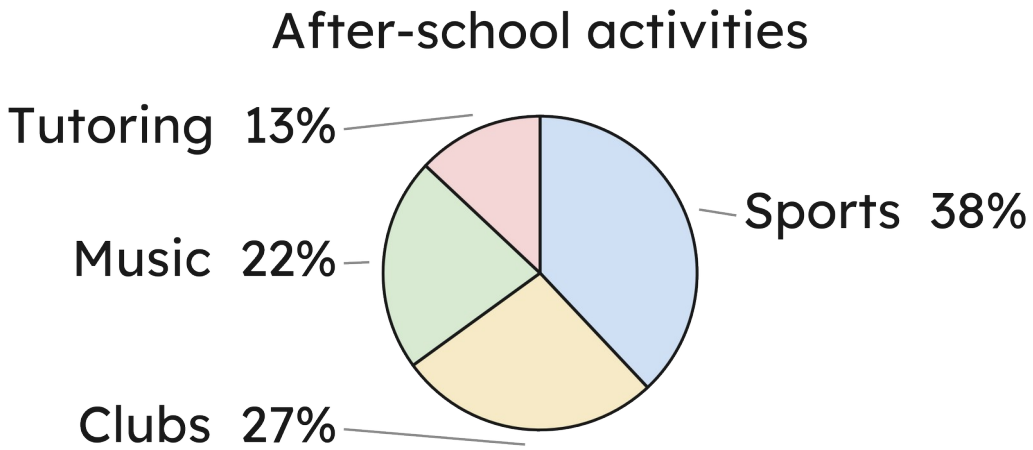
$0.22 \cdot 600 = 132$

Answer: 132 students

Whiteboards · Question 5 of 9

The same graph, 600 students.

How many more students are in sports than in clubs?

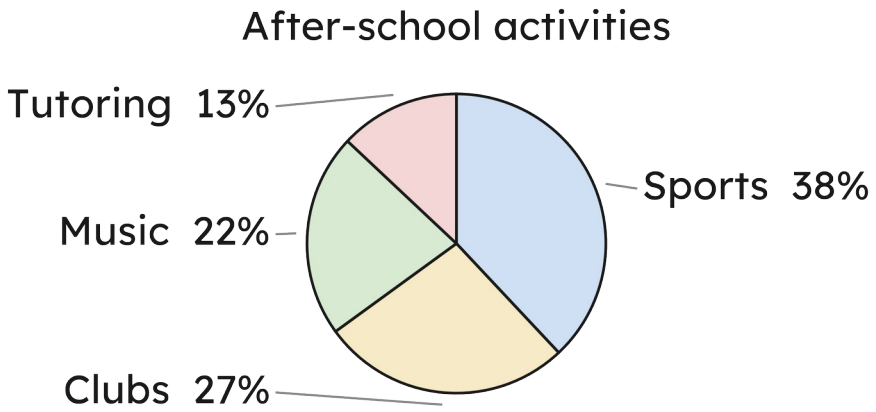


Answer it.

Whiteboards · Question 5 of 9

The same graph, 600 students.

How many more students are in sports than in clubs?



Sports: $0.38 \cdot 600 = 228$

Clubs: $0.27 \cdot 600 = 162$

$228 - 162 = 66$

Answer: 66 more students

Whiteboards · Question 6 of 9

A survey asked 300 students how they get to school:

Bus 45%, Car 28%, Walk 17%, Bike 10%.

Which statement is true?

A. 17% of them bike

B. 28 students go by car

C. 51 students walk

D. Over half ride the bus

Answer it.

Whiteboards · Question 6 of 9

A survey asked 300 students how they get to school:

Bus 45%, Car 28%, Walk 17%, Bike 10%.

Which statement is true?

Walk: $0.17 \cdot 300 = 51$

Car: $0.28 \cdot 300 = 84$

Bus 45%: under half. Bike 10%

Answer: C — 51 students walk

Whiteboards · Question 7 of 9

Green is 15% of a circle graph of 80 students,

and 15% of a circle graph of 240 students.

How many chose green in each graph?

A. 15 in each graph

B. 12 of 80; 36 of 240

C. 12 in each graph

D. 15 of 80; 45 of 240

Answer it.

Whiteboards · Question 7 of 9

Green is 15% of a circle graph of 80 students,

and 15% of a circle graph of 240 students.

How many chose green in each graph?

The percent is the same: 15% in both

The counts are not: $0.15 \cdot 80 = 12$ and $0.15 \cdot 240 = 36$

Answer: B — 12 of the 80 and 36 of the 240

Whiteboards · Question 8 of 9

In a survey of 400 students, 24% chose art and 13% chose music.

How many of the students chose art?

Answer it.

Whiteboards · Question 8 of 9

In a survey of 400 students, 24% chose art and 13% chose music.

How many of the students chose art?

Art: 24% of 400

$$0.24 \cdot 400 = 96$$

Answer: 96 students

Whiteboards · Question 9 of 9

Ava's circle graph has four sectors: 40%, 30%, 25% and 15%.

Can her graph be right? Explain.

Write your answer in sentences.

Whiteboards · Question 9 of 9

Ava's circle graph has four sectors: 40%, 30%, 25% and 15%.

Can her graph be right? Explain.

$40 + 30 + 25 + 15 = 110$

The sectors are one whole, and one whole is 100%

Answer: No: the sectors total 110%, not 100%

Independent Practice

1. Favorite drink of 500 students: Water 34%, Juice 27%, Milk ?, Soda 15%. What percent chose milk?

2. In question 1, how many students chose water?

3. In question 1, how many students chose milk?

4. In question 1, how many more students chose juice than soda?

5. In a survey of 450 students, 16% walk to school. How many walk?

6. A circle graph of 800 students has sectors 45%, 30%, 20% and one more. How many students are in the last sector?

Before You Go

A circle graph is one whole: its sectors total 100%.

A sector's count is its percent, as a decimal, times the total.

Tomorrow: each sector's angle, as a fraction of 360°.

IXL

1. Open IXL and start today's skills.
2. Work on paper where the question needs work. The answer box does not show it.
3. Every skill listed is required, to a SmartScore of 60. Today's skill, V76, is warm-up question 3: an angle that is a fraction of a full turn. Every Unit 7 skill is due by the Unit 7 test.

Today's skills — all required

Use fractions to find the measure of an angle (V76)