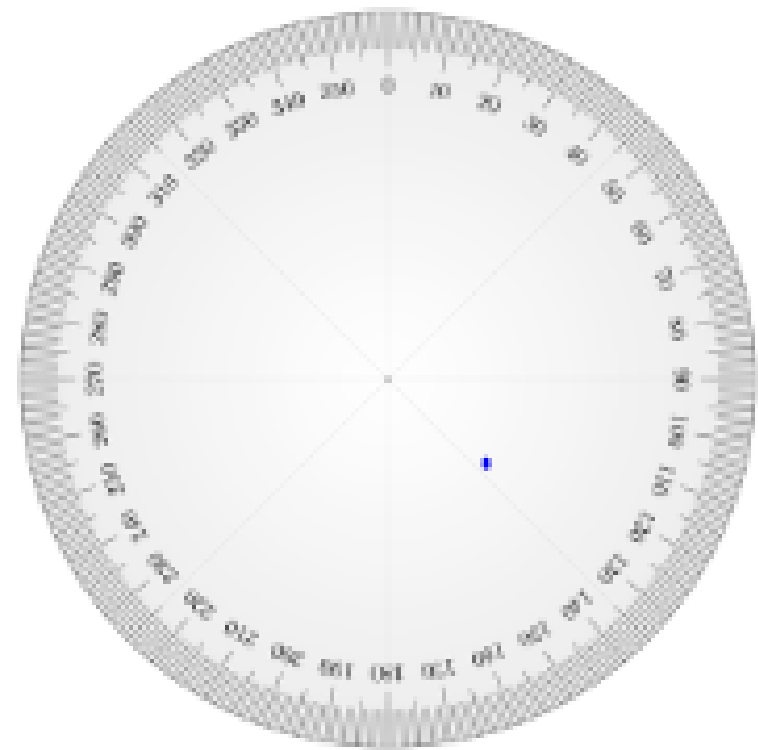# CONSTRUCTING PIE GRAPH

If you divide a circle into 360 degrees equal parts, each part is known as one degree.
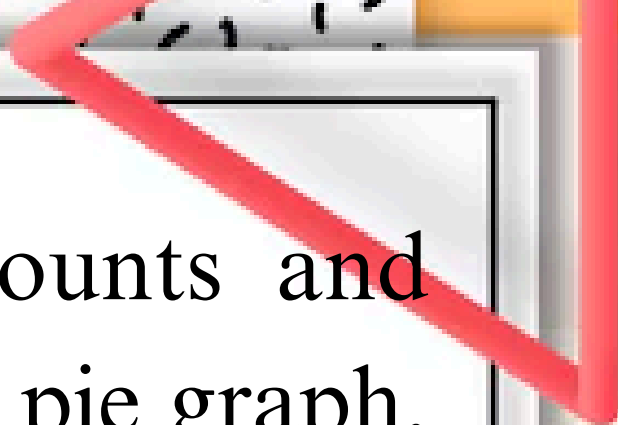
There are 360° in a circle

To measure the angle in degrees, we use a tool called a protractor. Start by aligning the notch at the center of the protractor's base with the initial side of the angle. Next, position the base of the protractor along the initial side of the angle.

The terminal side of the angle will intersect with the protractor's edge, where you can read the angle's measurement.

Note that the terminal side of the angle passes through the tick mark at the number 30 mark, indicating that the degree measure of this angle is 30°.

Terminal side

Initial side

The degree measure is 30°
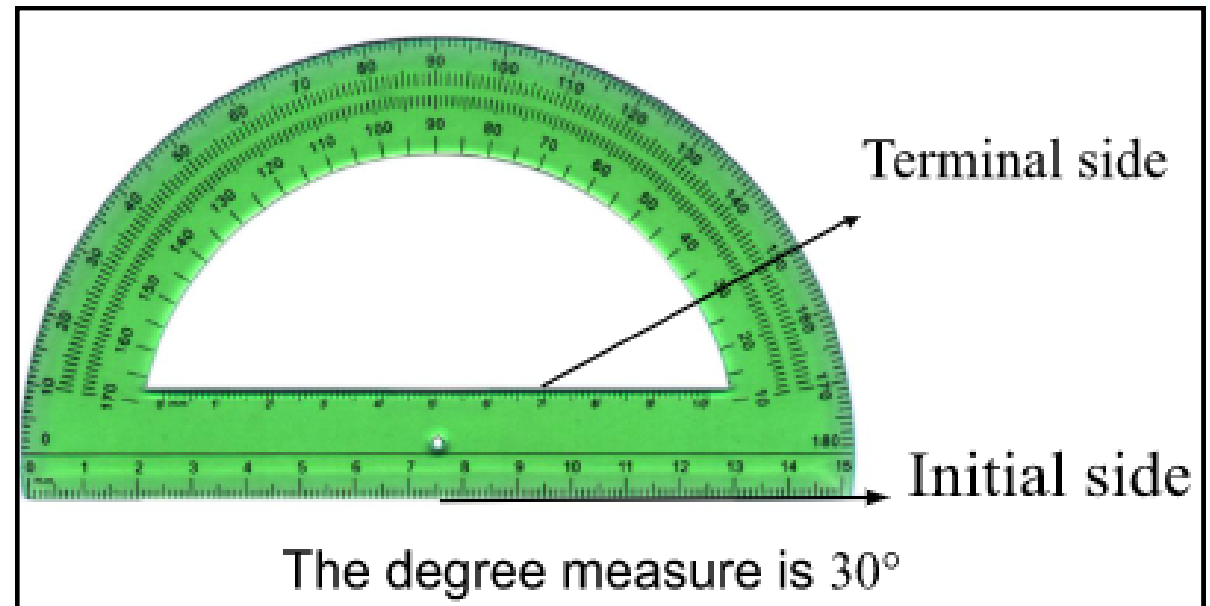
Now that we know how to measure angles, we can shift our focus to constructing pie graphs.

Graphs are useful for comparing amounts and identifying trends. One type of graph is the pie graph, which visually represents data as parts of a whole.

A pie graph is a circular chart where each segment represents a portion of the collected data. The entire pie chart corresponds to 100% of the total data. Pie graphs are effective for displaying the percentage distribution across different categories, as well as for visualizing the ratio of one category to another.

To draw a pie graph:

1. Calculate the angle for each section.

2. Draw a circle with a compass.

3. Use a protractor to measure and draw each angle, then label each section.

4. Add a title to the graph.

The formula to calculate the angle of a sector in a circle graph is:

$$\text{Angle sector} = \frac{Frequency\ of\ data}{Total\ frequency} \times 360°$$

Example:

In a school, there are 900 students in Year 1, 600 students in Year 2, and 500 students in Year 3. Draw a pie graph to represent the number of students in these groups.

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In a school, there are 900 students in Year 1, 600 students in Year 2, and 500 students in Year 3. Draw a pie graph to represent the number of students in these groups.

Solution:

Step 1: Calculate the total number of students

Add the number of students in Year 1, Year 2, and Year 3.

Total students = 900 + 600 + 500 = **2000**

Example:

In a school, there are 900 students in Year 1, 600 students in Year 2, and 500 students in Year 3. Draw a pie graph to represent the number of students in these groups.

Solution:

Step 2: Find the angle for each section using the formula

The formula to find the angle of each section is:

$$\text{Angle sector} = \frac{Frequency\ of\ data}{Total\ frequency} \times 360°$$

Example:

In a school, there are 900 students in Year 1, 600 students in Year 2, and 500 students in Year 3. Draw a pie graph to represent the number of students in these groups.
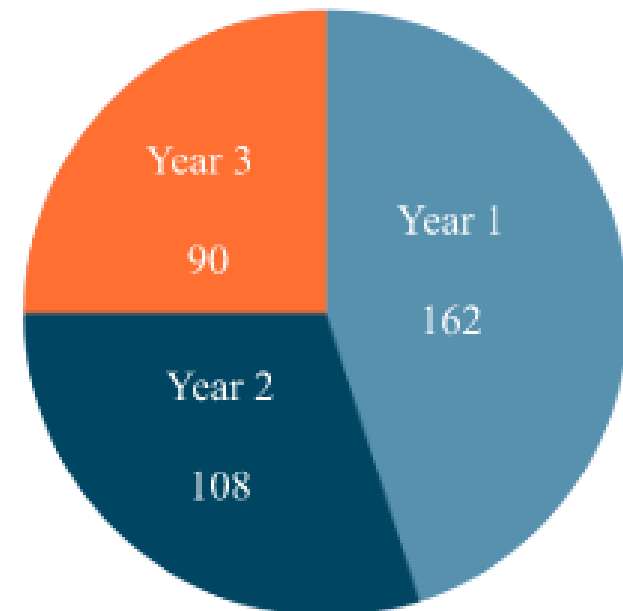
Solution:

Step 2: Find the angle for each section using the formula

Year 1: size of angle $= \dfrac{900}{2000} \times 360° = 162°$

Year 2: size of angle $= \dfrac{600}{2000} \times 360° = 108°$

Year 3: size of angle $= \dfrac{500}{2000} \times 360° = 90°$

Example:

In a school, there are 900 students in Year 1, 600 students in Year 2, and 500 students in Year 3. Draw a pie graph to represent the number of students in these groups.

Solution:

If you're using drawing software or a manual method, simply divide the circle using these angles to represent the students in each year group. Each segment will be labeled with the corresponding year group (Year 1, Year 2, Year 3) and their respective proportions.
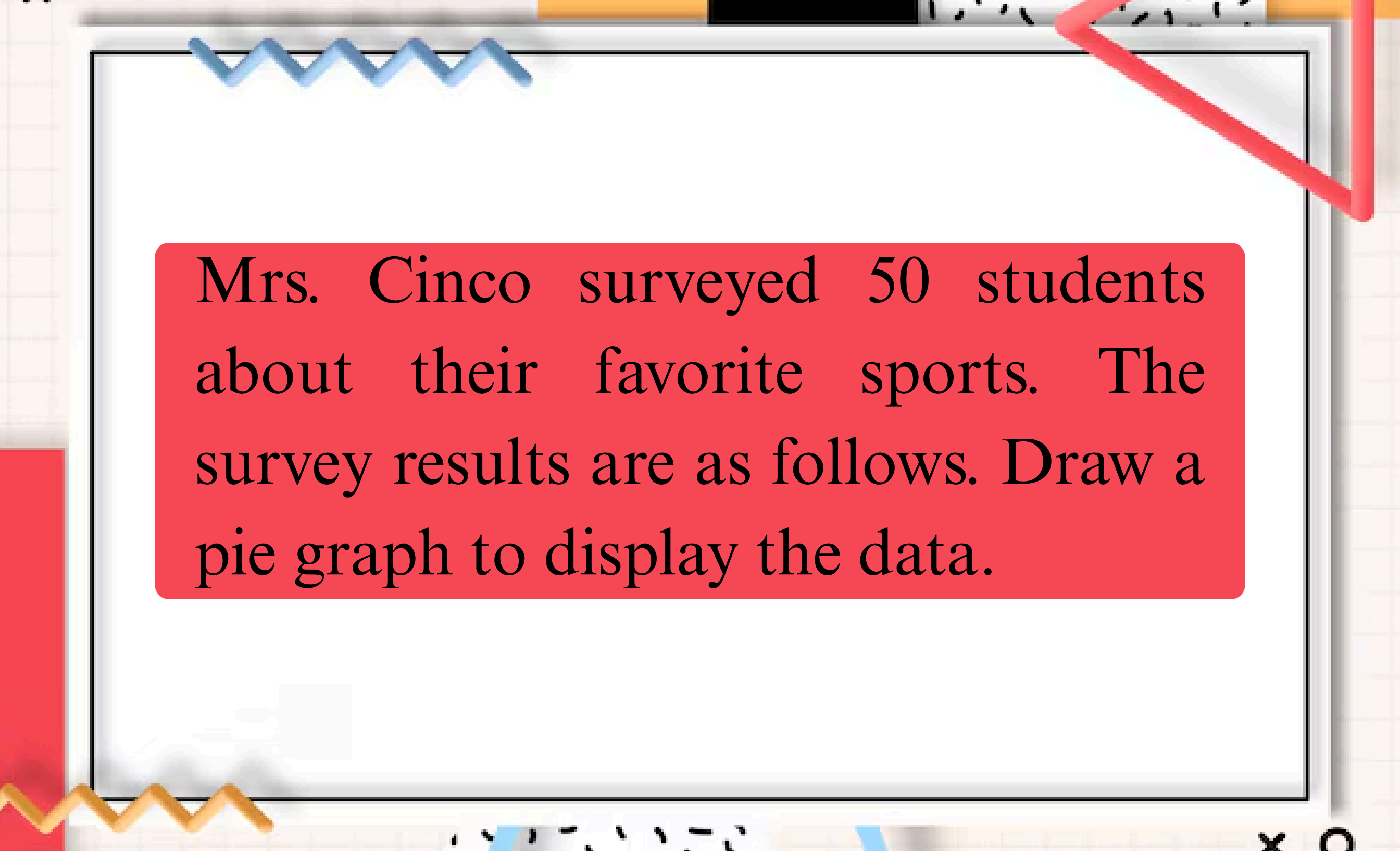
Year 3 90

Year 1 162

Year 2 108
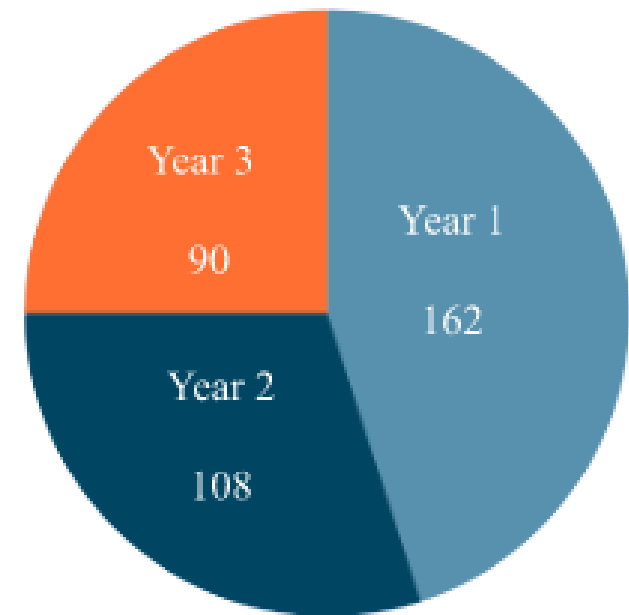
When we express the value of the component as a percentage, we obtain the central angle that corresponds to the component.

$$\textbf{Angel sector} = \frac{Percentage\ Value\ of\ Component}{100} \times \textbf{360}^{\circ}$$

To draw a graph:

1. Calculate the percentage of the data that belongs to each category.
2. Calculate the portion of 360 degrees that represents each category.
3. Divide the circle accordingly.

Mrs. Cinco surveyed 50 students about their favorite sports. The survey results are as follows. Draw a pie graph to display the data.

To make it easier to graph the data, let's express the results as percentages.

Reading and Interpreting Pie Graphs

1. What fraction of students like soccer?

Answer: The sector in the pie chart show: $\dfrac{2}{5}$

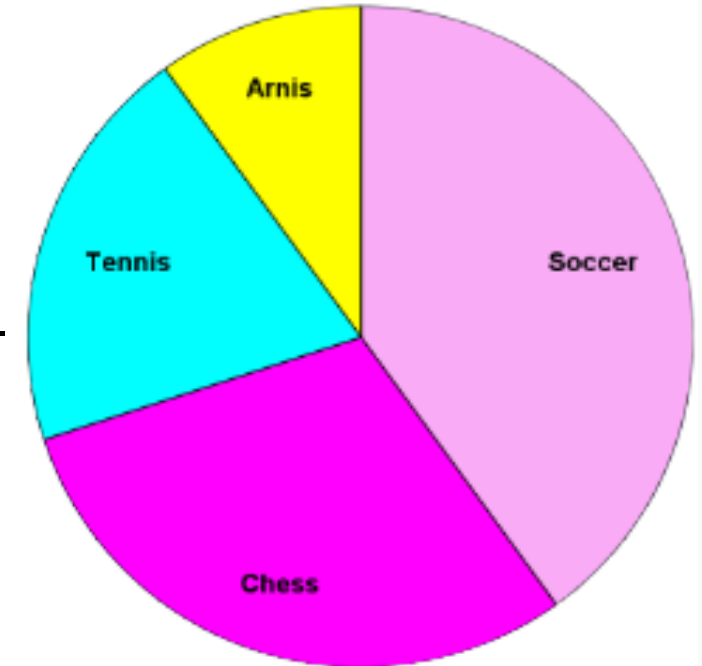2. What fraction of students like chess?

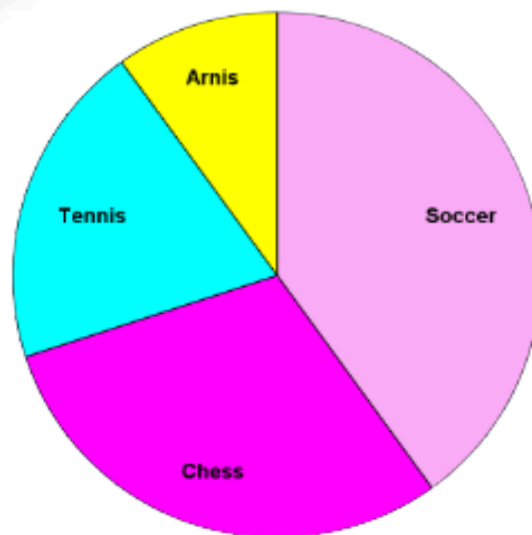Answer : The sector in the pie chart show: $\dfrac{3}{10}$

3. What fraction of students like tennis?

Answer : The sector in the pie chart show: $\dfrac{1}{5}$

4. What fraction of students like arnis?

Answer : The sector in the pie chart show: $\dfrac{1}{10}$

Sports	Votes	Percent	Angles (using the 1st formula of Angle sector)	Angles (using the 2nd formula of Angle sector)
Soccer	20	40%	$(20/50\times360°) = 144°$	$(40/100\times360°) = 144°$
Chess	15	30%	$(15/50\times360°) = 108°$	$(30/100\times360°) = 108°$
Tennis	10	20%	$(10/50\times360°) = 72°$	$(20/100\times360°) = 72°$
Arnis	5	10%	$(5/50\times360°) = 36°$	$(10/100\times360°) = 36°$
Total	50	100%	$360°$	$360°$