2.4 Circle Graphs

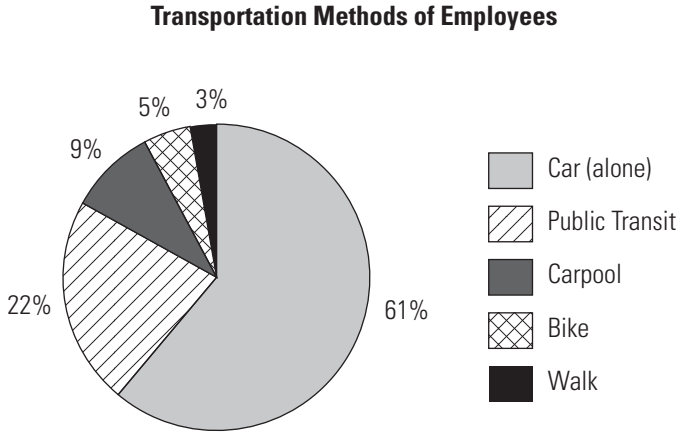
NEW SKILLS: WORKING WITH CIRCLE GRAPHS

A circle graph is used to display how a whole is divided. The sectors of the circle represent parts of the data.

For more details, see page 99 of *MathWorks 11*.

Example 1

The following circle graph shows how people in Maxine's office building get to work. There are 350 people working in the building.



a) What percentage of the people walk to work? How many people does this represent?

b) What percentage of people come to work in a car? How many people is this?

c) Consider those who carpool, walk, or bike. Is this more or less than the number who take public transport? How many more or less?

SOLUTION

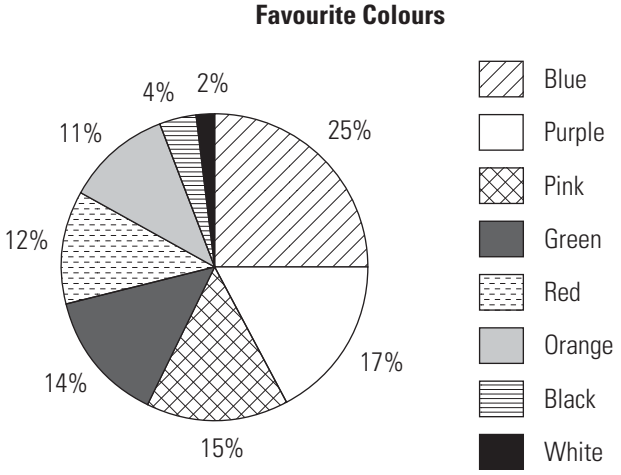
a) The graph shows that 3% of the people walk to work. Calculate 3% of 350.

$0.03 \times 350 = 10.5$

11 people walk to work.

BUILD YOUR SKILLS

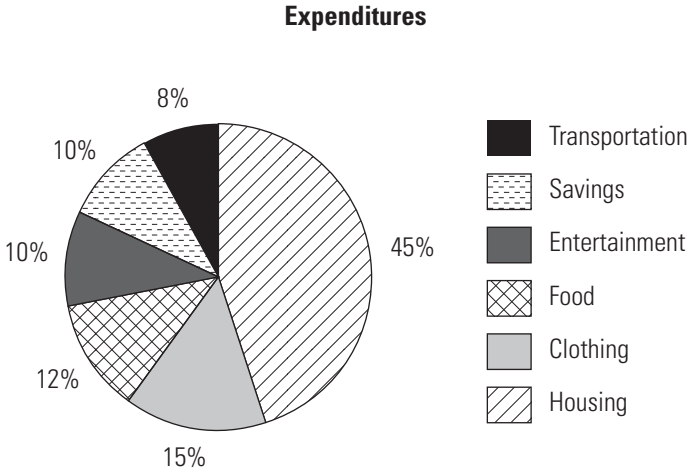
1. The circle graph below shows the results of a student survey: 171 students were asked their favourite colour.



a) How many students chose green as their favourite colour?

b) What is the most popular colour? Approximately how many students chose it?

2. The circle graph below indicates the percentage of his income that Frank spends on different items.

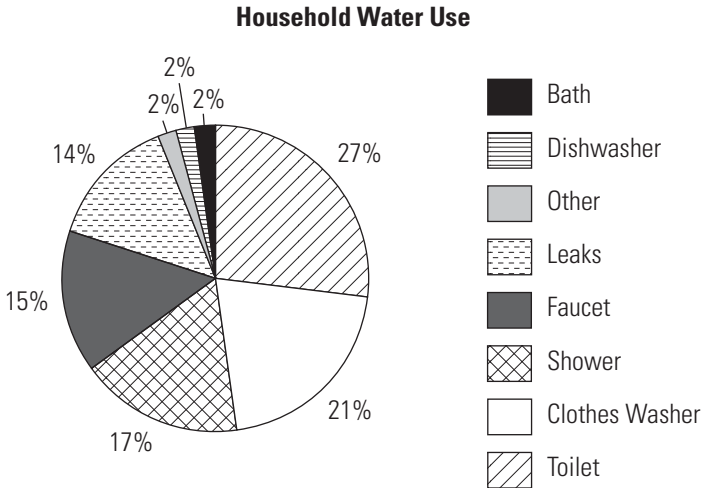


a) On what two items does he spend the same amount?

b) If he puts $250.00 per month into savings, what is his total income?

c) Draw a bar graph depicting the same information. Which graph gives you a better picture of his expenditures? Why?

3. The circle graph below shows a typical household's water use.



a) What is the total percentage of water used for the faucet, shower, and bath?

b) What percentage is used by the dishwasher and the clothes washer?

c) Which two uses together account for about half of the water used per day?

Example 2

Jasmine surveyed students at her college to find out how they commute to school. The results are shown in the table below. Create a circle graph of the data.

SURVEY RESULTS: MODE OF TRANSPORTATION TO SCHOOL						
Means of travel	*Car (alone)*	*Carpool*	*Motorbike*	*Bus*	*Bicycle*	*Walk*
Number of people	75	20	5	75	10	15

SOLUTION

Step 1: To draw a circle graph, first calculate what proportion of the total data is represented by each category.

Calculate the total number of people surveyed.

$75 + 20 + 5 + 75 + 10 + 15 = 200$

Car (alone) and Bus: 75 people each

$$\frac{75}{200} = 0.375$$

Carpool: 20 people

$$\frac{20}{200} = 0.1$$

Motorbike: 5 people

$$\frac{5}{200} = 0.025$$

Bicycle: 10 people

$$\frac{10}{200} = 0.05$$

Walking: 15 people

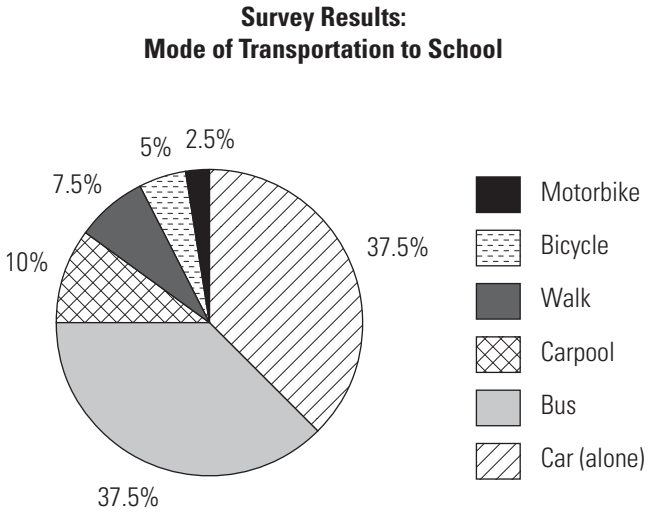
$$\frac{15}{200} = 0.075$$

Step 2: Next, calculate how many degrees of the 360 degrees of a circle are represented by each category.

Car (alone):	0.375 × 360° = 135°
Carpool:	0.1 × 360° = 36°
Motorbike:	0.025 × 360° = 9°
Bus:	0.375 × 360° = 135°
Bicycle:	0.05 × 360° = 18°
Walking:	0.075 × 360° = 27°

Step 3: Draw a circle and a radius. Use your protractor to measure the degrees of the first section. Label the sector.

Measure the next section from one edge of the first. Continue until you have marked and labelled each sector.

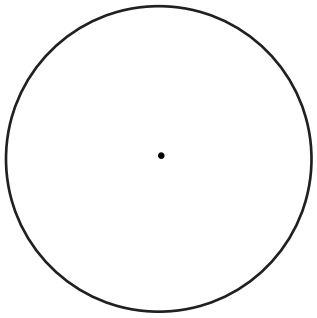


BUILD YOUR SKILLS

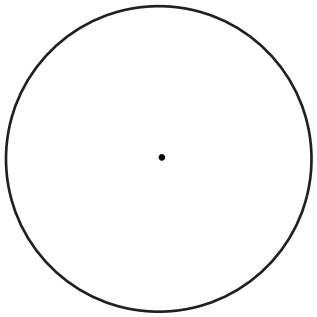
4. Patty surveyed students at her school to find out what kind of pets they have. The following table shows the survey results.

SURVEY RESULTS: TYPE OF PET			
Pet	*Dog*	*Cat*	*Rodent (gerbil/rat/mouse)*
Number of students	39	44	21

a) Draw a circle graph to represent the data.

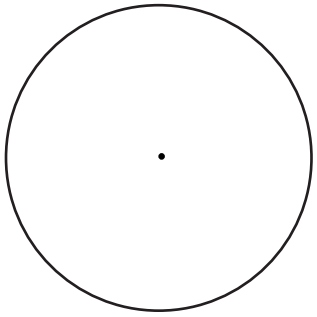


b) Gerard says that the graph does not accurately display the data as there were 24 students who do not have pets and that this should be recorded. If this data is included, what difference will it make to the size of the sectors? Draw a circle graph to include the sector of students who do not have pets.



5. A school had a fundraiser to help raise money for international disaster relief. The table below shows the amounts raised through different activities. Display the information on a circle graph.

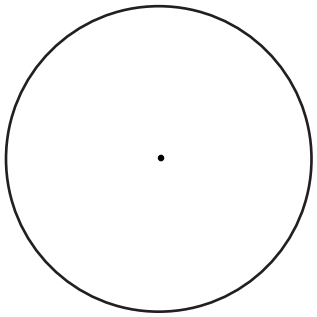
SCHOOL FUNDRAISING FOR INTERNATIONAL DISASTER RELIEF					
Means of fundraising	*Parental donations*	*Chocolate bar sales*	*Hot lunches*	*Concert proceeds*	*Classroom donations*
Amount raised	$750.00	$325.00	$375.00	$150.00	$100.00



6. Marjorie is a stockperson at a drugstore. She tracks sales of the different brands of hairspray sold at the store. The table below indicates the number of containers of each brand that sold in the past month.

HAIRSPRAY SALES IN ONE MONTH						
Hairspray brand	*A*	*B*	*C*	*D*	*E*	*F*
Number of containers	68	45	127	93	76	12

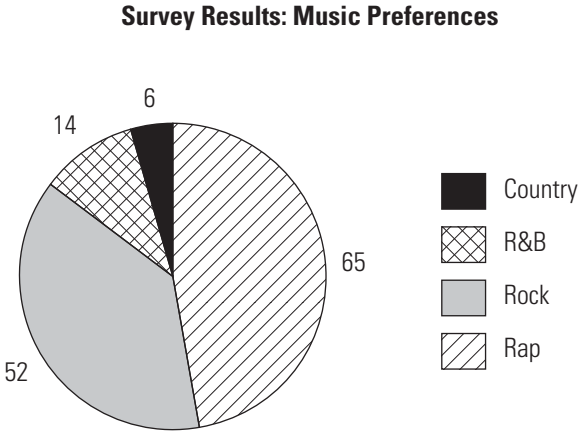
a) Draw a circle graph to display the data.



b) Display the data on one other type of suitable graph.

PRACTISE YOUR NEW SKILLS

1. Before a school dance, the organizing committee did a survey of students to find out their music preferences. The graph below shows the number of students who prefer each type of music.



a) How many people were surveyed?

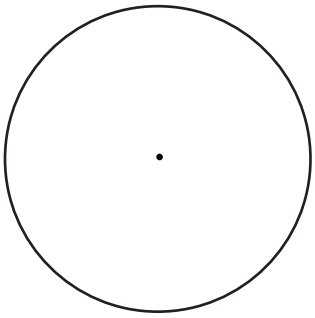
b) What percentage of the people prefer rock music?

c) Calculate the number of degrees in the circle that represent those who prefer R&B music.

2. Greg works as a tour guide. He tracks how tourists heard about the tours.

   - 60% took the tour as part of a travel package;
   - 15% had the tour recommended by the local tourism office;
   - 10% came based on the recommendation of a friend; and
   - the remainder were walk-ins.

   Draw a circle graph to display the data. Show all calculations.



3. Given the bar graph below, create a circle graph that displays the same information.