

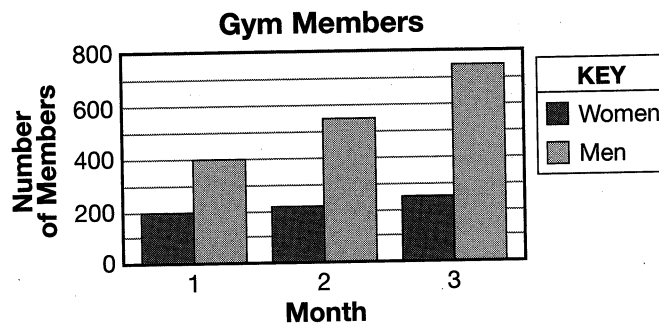
Strategy Focus Look for a Pattern

MATH FOCUS: Collect, Organize, and Display Data

Learn

Read the Problem

A gym has been running a new ad campaign. The goal is to balance the ratio of female to male members. The graph shows how the ratio changes each month since the ad campaign began. Is the ratio of women to men increasing, decreasing, or neither?



Reread Read the problem and study the graph.

- What is the problem about?

- What does the graph show?

- What does the problem ask?

Mark
the Text



Search for Information

Read the problem again. Think about how the graph displays the data.

Record Write the data from the graph in a table.

Gym Members

Month	1	2	3
Number of Women		220	
Number of Men			

Use this information to help you choose a problem-solving strategy.

Decide What to Do

You know the number of women and the number of men who are members at the gym each month. The bar graph helps you to see how those numbers are changing.

Ask How can I determine if the ratio of women to men is increasing, decreasing, or neither?

- I can calculate the ratio of women to men for each month.
- I can use the strategy *Look for a Pattern* to see how the ratios compare from month to month.

Use Your Ideas

Step 1 Find the ratio of women to men for each month.

$$\text{Month 1: } \frac{200}{400} = \frac{1}{2}$$

$$\text{Month 2: } \frac{220}{\quad} = \frac{2}{\quad}$$

$$\text{Month 3: } \frac{\quad}{\quad} = \frac{1}{\quad}$$

Step 2 Compare the ratios to look for a pattern. Use a common denominator.

The common denominator is $2 \times 5 \times 3 = \underline{\quad}$.

$$\text{Month 1: } \frac{1}{2} = \frac{\quad}{30}$$

$$\text{Month 2: } \frac{2}{5} = \frac{\quad}{30}$$

$$\text{Month 3: } \frac{1}{3} = \frac{\quad}{30}$$

So the ratio of women to men is $\underline{\quad}$.

Review Your Work

Check that you read the data from the graph correctly.

Identify How does the graph help you solve the problem?

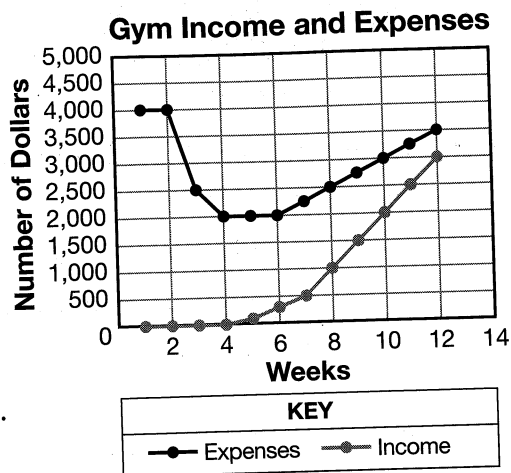


Look for a pattern or trend that might show a general increase, decrease, or steadiness.

Try

Solve the problem.

1 Jack and Rachel opened a fitness center. The graph shows their income and expenses for the first 12 weeks of business. They notice that after Week 8, their profit continues to change in the same way. Predict the profit for Week 16.



Read the Problem and Search for Information

Underline what you need to find. Study the graph.

Decide What to Do and Use Your Ideas

You can use the strategy *Look for a Pattern* to solve the problem.

Ask Yourself

Is the profit increasing, decreasing, or neither?

Step 1 Look for a pattern in the profit starting at Week 8.

Week	8	9	10	11	12
Income (dollars)	1,000	1,500	2,000	2,500	
Expenses (dollars)	2,500	2,750		3,250	
Profit (dollars)	-1,500				

Step 2 How much does the profit increase each week? _____

Use the pattern to find the profit in Week 16.

$$\text{Week 12 profit} + 4(\$250) = \text{Week 16 profit}$$

$$-\$500 + \underline{\hspace{2cm}} = \text{Week 16 profit}$$

So the profit for Week 16 might be about _____.

Review Your Work

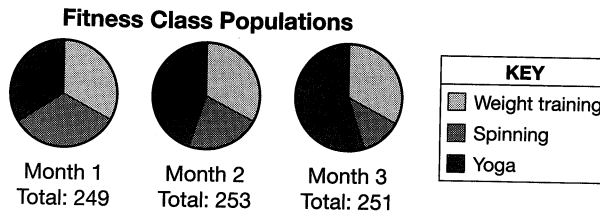
Extend the lines in the graph. Then compare the graph and your answer.

Recognize Is it reliable to predict profit in two years this way? Explain.

Apply

Solve the problems.

- ② A fitness club offers classes in weight training, spinning, and yoga. Every month, the manager makes a graph of the number of people in each class. Which classes are getting more popular, less popular, and staying the same in popularity?



Hint Use the key to identify each class on the circle graphs.

If the area of a section in the circle graph increases from month to month, it means _____ people are attending the class. If the area of a section in the circle graph decreases from month to month, it means _____ people are attending the class.

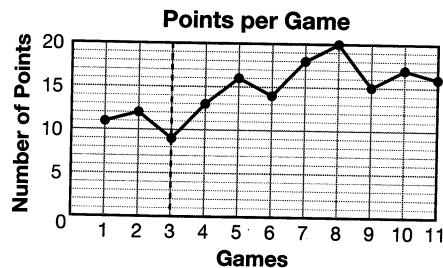
Ask Yourself
How can I find a pattern or trend in the popularity of each class?

Answer _____

Explain How can you estimate the number of people who attended Yoga class for Month 2 by looking at the graph?

- ③ Ruth had a coaching session with a basketball trainer after games 3, 6, and 9. Ruth plotted her points per game. In the game after each session, how does the number of points she scores change?

Draw vertical lines to show when coaching sessions took place.



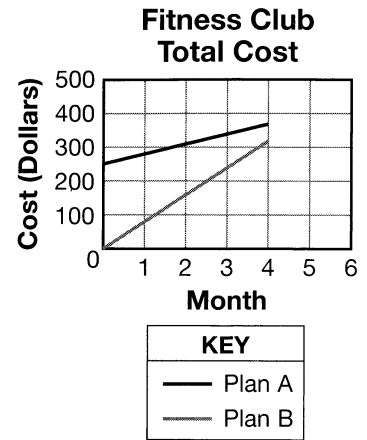
Ask Yourself
What does each point on the graph mean?

Answer _____

Describe What is another pattern in the graph that you can identify?

Hint Find a pattern or trend in the number of points Ruth scores in the game after each coaching session.

- 4 Gerry is joining a fitness club and needs to choose a membership plan. Plan A has a membership fee and a monthly fee. Plan B has no membership fee, but a higher monthly fee. The graph shows the total cost over time. Which plan should Gerry choose if she is going to be a member for 6 months? Explain.



Ask Yourself

What facts in the problem tell me where to stop extending the graph?

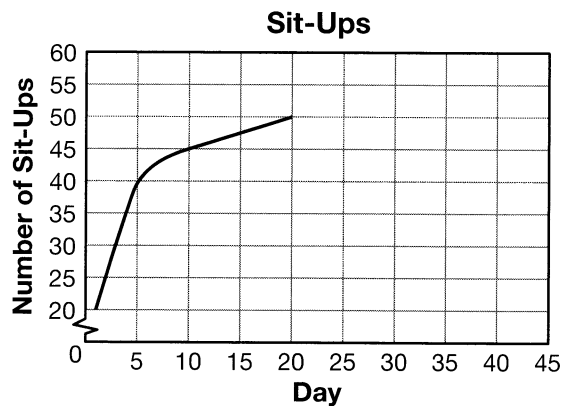
Hint Think about how the costs of the plans might compare *after* the two lines intersect.

Extend the graph to continue the pattern that shows the total costs.

► **Answer** _____

Conclude What does the point where the two lines intersect represent?

- 5 Andrew wants to increase the number of sit-ups he can do in one minute. Every day he records the number of sit-ups he does in a minute. If the pattern continues, about what day will it be when he is able to do 60 sit-ups in one minute?



Hint Andrew's improvement seems constant after Day 10. Continue the trend by extending the line.

Ask Yourself

How many days did it take Andrew to increase his sit-ups per minute from 45 to 50? From 50 to 55?

Will the line on the graph suddenly decrease on Day 21? _____

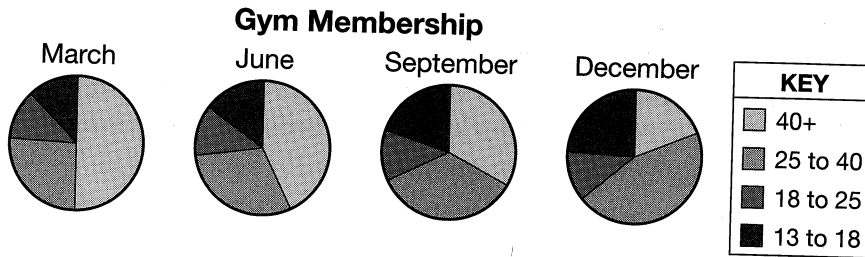
Answer _____

Predict Will the number of sit-ups Andrew can do in one minute continue to increase without limit?

Practice

Solve the problems. Show your work.

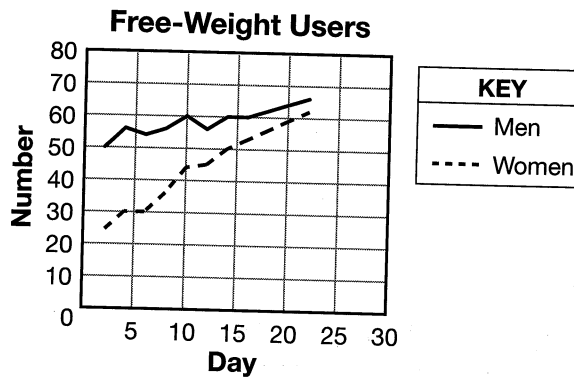
- 6 A gym started a campaign to increase the fraction of members who are 40 or older. Based on the results shown, is the fraction of members who are 40 or older increasing or decreasing?



Answer _____

Evaluate Why do you think circle graphs are useful for this data?

- 7 A gym is tracking the number of people using free weights. If the trend in the graph continues, about when will the number of men and women using free weights be the same?



Answer _____

Discuss How would you describe the overall trend on the graph?



Create

Write a new problem that includes a graph. Solve your problem using the strategy *Look for a Pattern*.