Applications

1. Use the table to answer parts (a)–(e).

Typical Weights for Tiger Cubs	
Age (weeks)	**Expected Body Weight (kg)**
birth	1.3
1	2.3
2	3.0
3	3.8
4	4.5
5	5.2
6	6.0
7	6.7
8	7.5
9	7.6
10	8.9
11	9.7

SOURCE: www.tigerlink.org

a. What weight is predicted for a 1-week-old tiger cub?

b. What weight is predicted for a 10-week-old tiger cub?

c. At what age do tiger cubs typically weigh 7 kilograms?

d. Describe the pattern relating age and weight. Do you expect this pattern to continue indefinitely?

**e.** Would it make sense to connect the points in a graph of these data?

2. Dezi researches DVD rental prices at local video stores. Source Video has a yearly membership package. The manager gives Dezi this table:

Source Video Membership/Rental Packages

Number of DVDs Rented	0	5	10	15	20	25	30
Total Cost		$30	$35	$40	$45	$50	$55	$60

Supreme Video does not have membership packages. Dezi makes the graph below to relate the cost at Supreme Video to the number of DVDs rented.

a. Both video stores have a good selection of movies. Dezi's family plans to watch about two movies a month. Which video store should they choose?

b. Write a paragraph explaining to Dezi how he can decide which video store to use.

c. For each store, describe the pattern of change relating the number of DVDs rented to the cost.

Supreme Video DVD Rentals
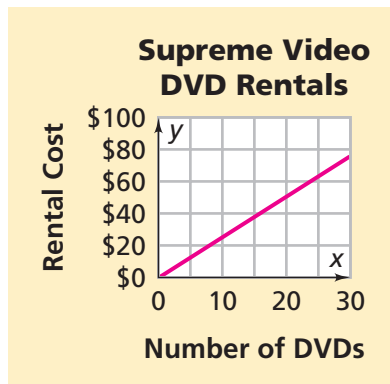
3. The table shows the fees charged at one of the campgrounds on the Ocean Bike Tour.

Campground Fees

Number of Campsites	1	2	3	4	5	6	7	8
Total Campground Fee	$12.50	$25.00	$37.50	$50.00	$62.50	$75.00	$87.50	$100.00

a. Make a coordinate graph of the data.

b. Does it make sense to connect the points on your graph? Explain.

c. Using the table, describe the pattern of change in the total campground fee as the number of campsites increases.

d. How is the pattern you described in part (c) shown in your graph?

4. Some class officers want to sell T-shirts to raise funds for a class trip. They ask the students in their class how much they would pay for a shirt and record the data in a table.

Projected Shirt Sales

Price per Shirt	$5	$10	$15	$20	$25
Number of Shirt Sales	50	40	30	20	10

a. Describe the relationship between the price per shirt and the expected number of shirt sales. Is this the sort of pattern you would expect?

b. Copy and complete this table to show the relationship between price per shirt and the expected total value of the shirt sales.

Projected Shirt Sales

Price per Shirt	$5	$10	$15	$20	$25
Number of Shirt Sales	50	40	30	20	10
Value of Shirt Sales	$250	$400	■	■	■

c. How would you describe the relationship between price per shirt and expected total value of shirt sales? Is this the sort of pattern you would expect?

d. Use grid paper to make coordinate graphs of the data like the ones started below.

Projected Shirt Sales

Projected Shirt Sales
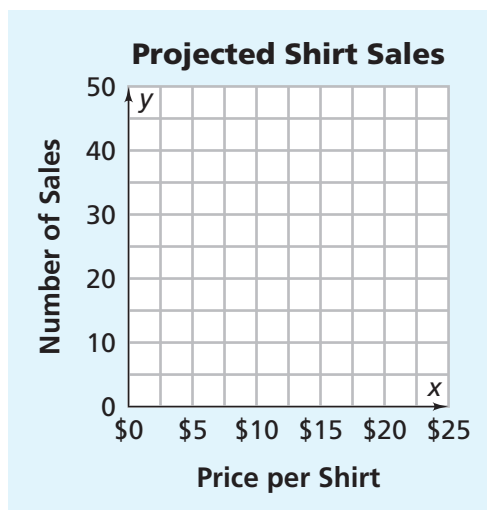
e. Explain how your answers to parts (a) and (c) are shown in the graphs.

5. A camping-supply store rents camping gear for $25 per person.

    a. Make a table of the total rental charges for 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, and 50 campers.

    b. Make a coordinate graph using the data in your table.

    c. Compare the pattern of change in your table and graph with patterns you found in Exercise 3. Describe the similarities and differences between the two sets of data.

6. The tour operators need to rent a truck to transport camping gear, clothes, and bicycle repair equipment. They check prices at two truck-rental companies.

    a. East Coast Trucks charges $4.25 for each mile driven. Make a table of the charges for 0, 25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, and 300 miles.

    b. Philadelphia Truck Rental charges $40 per day and an additional $2.00 for each mile driven. Make a table of the charges for renting a truck for five days and driving it 0, 25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, and 300 miles.
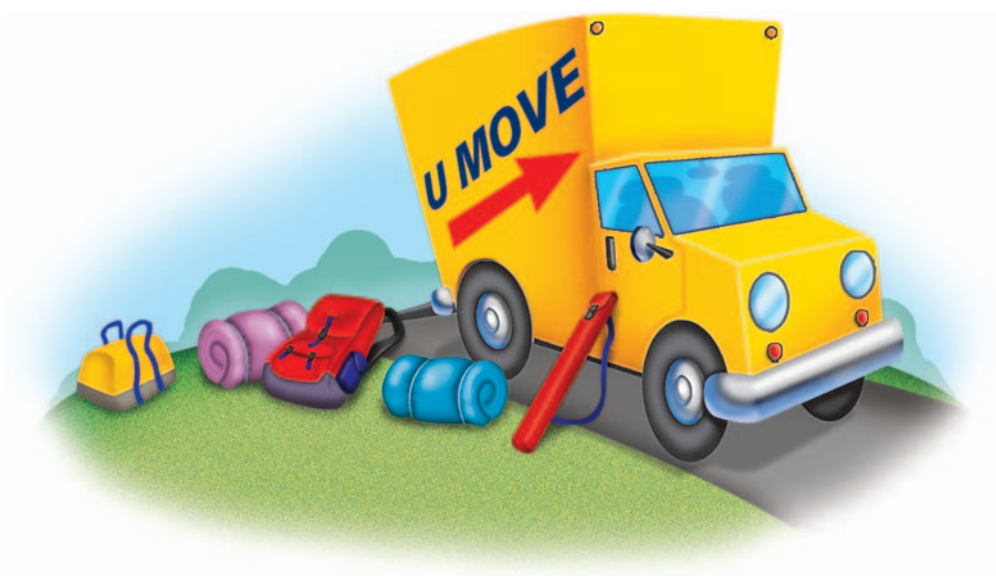

    c. On one coordinate grid, plot the charge plans for both rental companies. Use a different color to mark each company's plan.

    d. Based on your work in parts (a)–(c), which company offers the better deal? Explain.

7. The table shows fees for using a campsite at a state park from 1 day up to the park limit of 10 days.

Campsite Fees

| Days of Use	1	2	3	4	5	6	7	8	9	10
Campsite Fee	$20	$30	$40	$50	$60	$70	$75	$80	$85	$90

a. Make a coordinate graph using the table.

b. Does it make sense to connect the points on your graph? Why or why not?

c. Describe the pattern relating the variables *days of use* and *campsite fee*.

8. Suppose a motion detector tracks the time and the distance traveled as you walk 40 feet in 8 seconds. Match the following (*time, distance*) graphs with the "stories" that describe each walk.
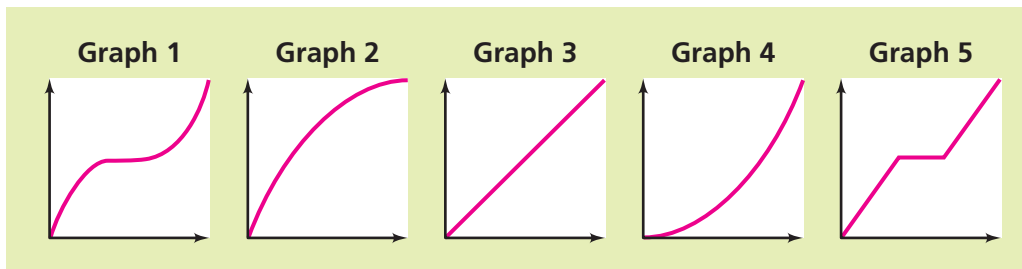

a. You walk at a steady pace of 5 feet per second.

b. You walk slowly at first and then steadily increase your walking speed.

c. You walk rapidly at first, pause for several seconds, and then walk at an increasing rate for the rest of the trip.

d. You walk at a steady rate for 3 seconds, pause for 2 seconds, and then walk at a steady rate for the rest of the trip.

e. You walk rapidly at first, but gradually slow down as the end of the trip nears.

9. For each walk in Exercise 8, complete a (*time, distance*) table like the one below. Use numbers that will match the pattern of the walk and its graph.

Time (seconds)	1	2	3	4	5	6	7	8
Distance (feet)	■	■	■	■	■	■	■	40

10. The graphs below show five patterns of change in the price per gallon of gasoline. Match each (*time, price*) graph with the "story" it tells.

| Graph 1 | Graph 2 | Graph 3 | Graph 4 | Graph 5 |
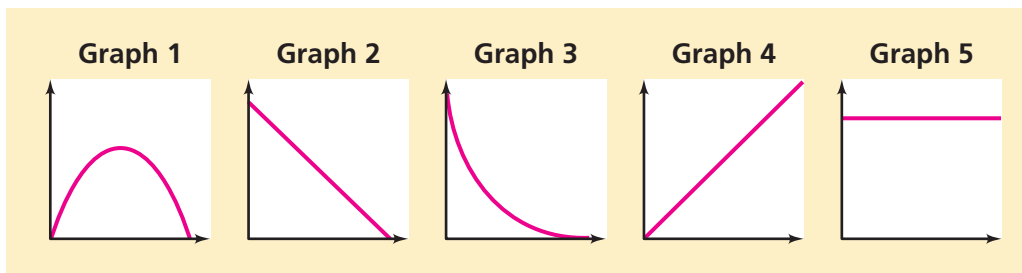
a. The price declined at a steady rate.

b. The price did not change.

c. The price rose rapidly, then leveled off for a while, and then declined rapidly.

d. The price rose at a steady rate.

e. The price dropped rapidly at first and then at a slower rate.

11. Multiple Choice Jamie is going to Washington, D.C., to march in a parade with his school band. He plans to set aside $25 at the end of each month to use for the trip. Choose the graph that shows how Jamie's savings will build as time passes.

A.

B.

C.
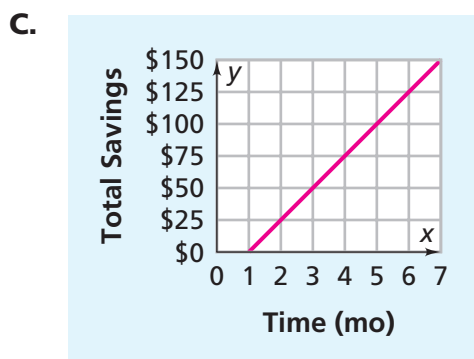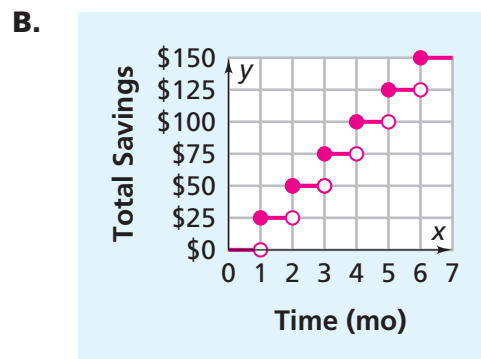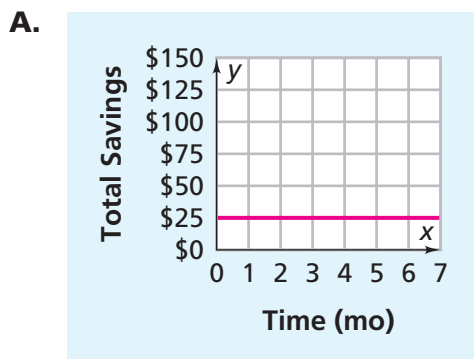
D. None of these is correct.

12. The graph shows how the temperature changed during an all-day hike by students.

Temperature During Hike
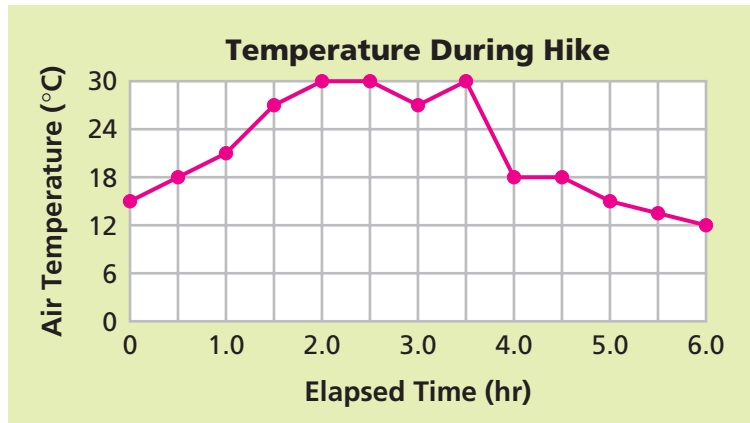
a. What was the maximum temperature and when did it occur?

b. When was the temperature rising most rapidly?

c. When was the temperature falling most rapidly?

d. When was the temperature about 24°C?

e. The hikers encounter a thunderstorm with rain. When do you think this happened?

Jacy works at a department store. This graph shows parking costs at the parking garage Jacy uses.

13. Multiple Choice How much does Jacy spend to park for less than a half hour?

   F. $0.50   **G.** $0.75

   H. $1   **J.** $1.50

14. Multiple Choice How much does Jacy spend to park for 4 hours and 15 minutes?

   A. $6   **B.** $6.50

   C. $6.75   **D.** $7

Parking Costs
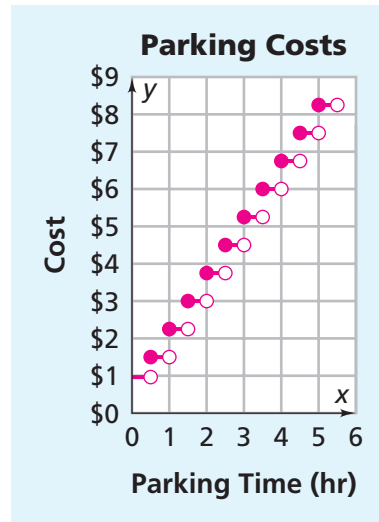
Connections

15. The area of a rectangle is the product of its length and its width.

   a. Find all whole number pairs of length and width values that give an area of 24 square meters. Record the pairs in a table.

length

width

Rectangles with an Area of 24 m²

Length	▪	▪	▪	…
Width	▪	▪	▪	…

   b. Make a coordinate graph of the (*length, width*) data from part (a).

   c. Connect the points on your graph if it makes sense to do so. Explain your decision.

   d. Describe the relationship between length and width for rectangles of area 24 square meters.

16. The perimeter of any rectangle is the sum of its side lengths.

   a. Make a table of all possible whole-number pairs of length and width values for a rectangle with a perimeter of 18 meters.

   b. Make a coordinate graph of the (*length, width*) data from part (a).

   c. Connect the points on your graph if it makes sense to do so. Explain your decision.

   d. Describe the relationship between length and width for rectangles of perimeter 18 meters, and explain how that relationship is shown in the table and graph.

Homework Help Online
PHSchool.com
**For:** Help with Exercise 16
Web Code: ane-1216

17. The table below shows the winners and the winning times for the women's Olympic 400-meter dash since 1964.

Womens Olympic 400-meter Dash		
Year	**Name**	**Time (seconds)**
1964	Celia Cuthbert, AUS	52.0
1968	Colette Besson, FRA	52.0
1972	Monika Zehrt, E. GER	51.08
1976	Irena Szewinska, POL	49.29
1980	Martia Koch, E. GER	48.88
1984	Valerie Brisco-Hooks, USA	48.83
1988	Olga Bryzgina, USSR	48.65
1992	Marie-Jose Perec, FRA	48.83
1996	Marie-Jose Perec, FRA	48.25
2000	Cathy Freeman, AUS	49.11
2004	Tonique Williams-Darling, BAH	49.41

a. Make a coordinate graph of the (*year, time*) information. Choose a scale that allows you to see the differences between the winning times.

b. What patterns do you see in the table and graph? Do the winning times seem to be rising or falling? In which year was the best time earned?

18. The circumference of a circle is related to its radius by the formula $C = 2 \times \pi \times r$. The area of a circle is related to its radius by the formula $A = \pi \times r^2$.

$C = 2 \times \pi \times r$
$A = \pi \times r^2$
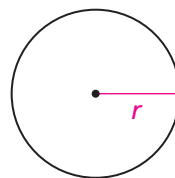
a. Make a table showing how the circumference of a circle increases as the radius increases in 1-unit steps from 1 to 6. Make sure to express the circumferences in terms of π. Then describe the pattern relating those two variables.

b. Make a table showing how the area of a circle increases as the radius increases in 1-unit steps from 1 to 6. Make sure to express the areas in terms of π. Then describe the pattern relating those two variables.

19. Here are the box-office earnings for a movie during each of the first eight weeks following its release.

Box Office Earnings

| Weeks in Theaters	1	2	3	4	5	6	7	8
Weekly Earnings (millions)	$16	$22	$18	$12	$7	$4	$3	$1

a. Make a coordinate graph showing the weekly earnings after each week. Because a film's weekly earnings depend on the number of weeks it is in theaters, put the weeks in theaters on the *x*-axis and the weekly earnings on the *y*-axis.

b. Explain how the weekly earnings changed as time passed. How is this pattern of change shown in the table and the graph? Why might this change have occurred?

c. What were the total earnings of the movie in the eight weeks?

d. Make a coordinate graph showing the total earnings after each week.

e. Explain how the movie's total earnings changed over time. How is this pattern of change shown in the table and the graph? Why might this change have occurred?

Extensions

20. Use what you know about decimals to find coordinates of five points that lie on the line segment between the labeled points on each graph:

a.

b.
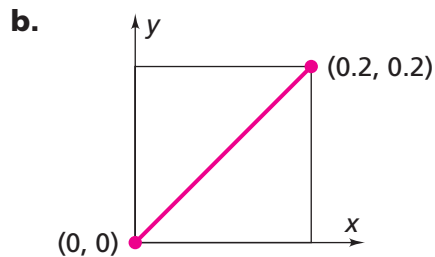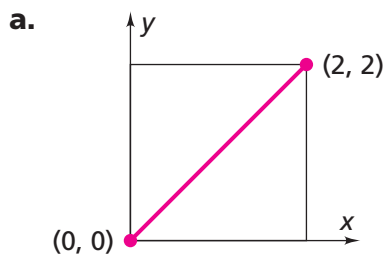
21. The graphs below each show relationships between independent
(*x*-axis) and dependent (*y*-axis) variables. However, the scales on the
coordinate axes are not the same for all the graphs.

Graph 1

Graph 2
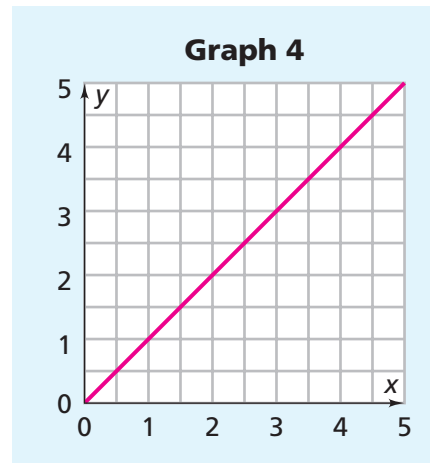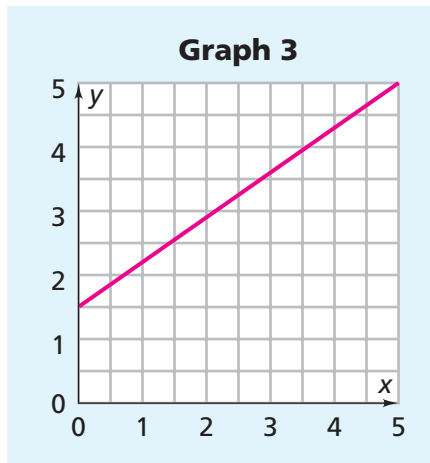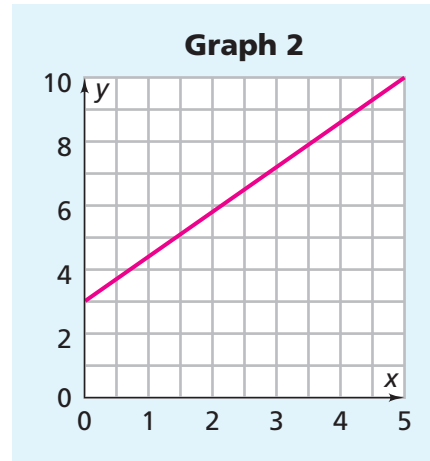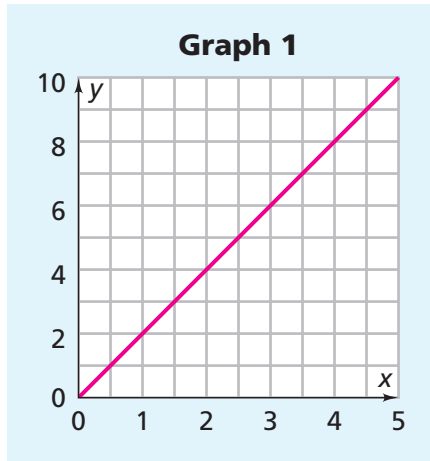
Graph 3

Graph 4

a. Which graph shows the dependent variable increasing most rapidly
as the independent variable increases?

b. Which graph shows the dependent variable increasing most slowly
as the independent variable increases?

22. To raise money, students plan to hold a car wash. They ask some adults how much they would pay for a car wash. The table below shows the results of their research.

Price Customers Would Pay for a Car Wash

Car Wash Price	$4	$6	$8	$10	$12	$14
Number of Customers	120	105	90	75	60	45

a. Make a coordinate graph of the (*price, customers*) data. Connect the points if it makes sense to do so.

b. Describe the pattern relating the price to the number of customers. Explain how the table and the graph show the pattern.

c. Based on the pattern, what number of customers would you predict if the price were $16? What number would you predict if the price were $20? What if the price were $2?

23. a. Copy and complete the table below, using the information from Exercise 22.
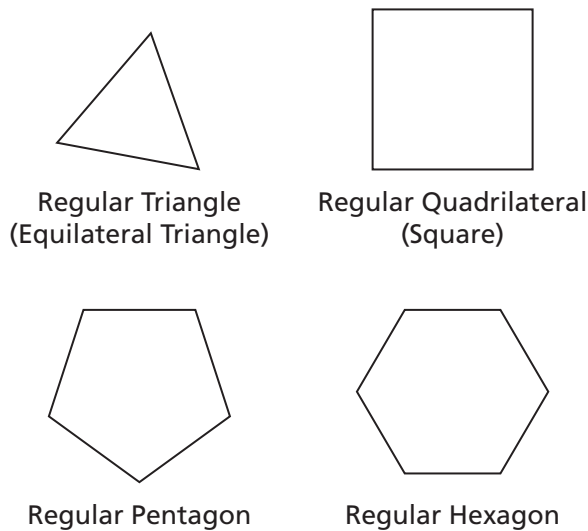
Projected Car Wash Income

| Car Wash Price	$4	$6	$8	$10	$12	$14
Number of Customers	120	105	90	75	60	45
Projected Income	■	■	■	■	■	■

b. Make a graph of the (*price, projected income*) data. Connect the points if it makes sense to do so.

c. Describe the pattern relating the price and the projected income. Explain how the table and the graph show the pattern. Explain why the pattern does or does not make business sense to you.

d. Suppose the shopping center where the students plan to hold the car wash will charge the students $1.50 per car for water and cleaning supplies. How can you use this factor to find the profit from the car wash for various prices?

24. Adriana is at a skateboard park that has tracks shaped like regular polygons. Recall that a *regular polygon* is a polygon with congruent sides and congruent angles. Here are some examples:

Regular Triangle
(Equilateral Triangle)

Regular Quadrilateral
(Square)

Regular Pentagon

Regular Hexagon

At each vertex of a track, Adriana must make a turn. The size of the turn relates to the number of sides in the polygon. For example, at each vertex of the triangle track, she must make a 120° turn.
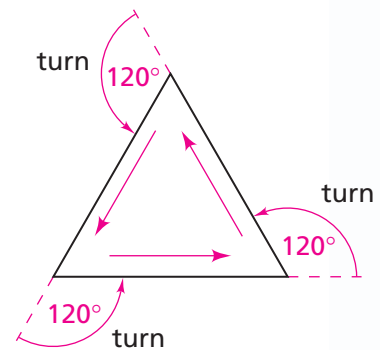
a. Copy and complete the table below to show how the size of the turn Adriana must make at each vertex is related to the number of sides of the polygon.

Track Turns

Number of Sides	3	4	5	6	7	8	9	10
Degrees in Turn	120	■	■	■	■	■	■	■

b. Make a coordinate graph of the (*sides, degrees*) data.

c. What pattern of change do you see in the degrees Adriana must turn as the number of sides increases? How does the table show that pattern? How does the graph show that pattern?