Question Bank

1. a. Copy the table below and then fill in the missing numbers for each column in ways that seem to fit patterns begun in the first several rows.

x	y_1	y_2	y_3	y_4
1	0	1	2	1
2	0	4.5	4	$\frac{1}{2}$
3	0	8	8	$\frac{1}{3}$
4	0	11.5	16	$\frac{1}{4}$
5	0	15	32	$\frac{1}{5}$
6				
			1,024	
			2,048	
N				

b. Are any of the patterns linear? Explain your reasoning.

c. Do any of the patterns exhibit inverse variation? Explain your reasoning.

2. Use the table below to answer parts (a) and (b).

x	2	3	7	14	21
y	42	28	12	6	4

a. Are x and y linearly or inversely related? How do you know?

b. Write an equation to describe the relationship between x and y.

3. Diane started working at an ice cream shop for $6 per hour. She will receive a $2 raise for every year she works at the shop.

a. Write an equation that expresses her salary in terms of years spent working at the ice cream shop.

b. Use this equation to find Diane's salary after five years of working at the ice cream shop.

4. When Garret was born, Aunt Darla put a quarter in a piggy bank for him. She said she would double the amount she gave him on each birthday until he became a teenager (at age 13). Uncle Owen gave Garret $50 the day he was born. He said he would give him that same amount on every birthday until Garret became a teenager.

   a. Make a table for each gift plan showing how much Garret will receive from Aunt Darla and Uncle Owen on each birthday.

   b. Plot the data for each plan on the same coordinate grid. Draw a graph model that best fits the trend in each plan.

   c. Describe the shape of the graph model for each plan.

   d. Compare the total amounts that Garret will receive from his aunt and his uncle.

5. Find an equation of the line that passes through points *A* and *B*.
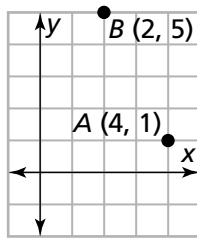
6. Find an equation of the line that passes through the point $(0, 5)$ and has slope 4.

7. Find an equation of the line that passes through the point $(4, 5)$ and has slope -2.

8. a. What is an equation of the line shown on the graph at the right?

   b. Write equations for two other lines that pass through the point $(4, 2)$.

   c. Graph the equations you wrote in part (b).
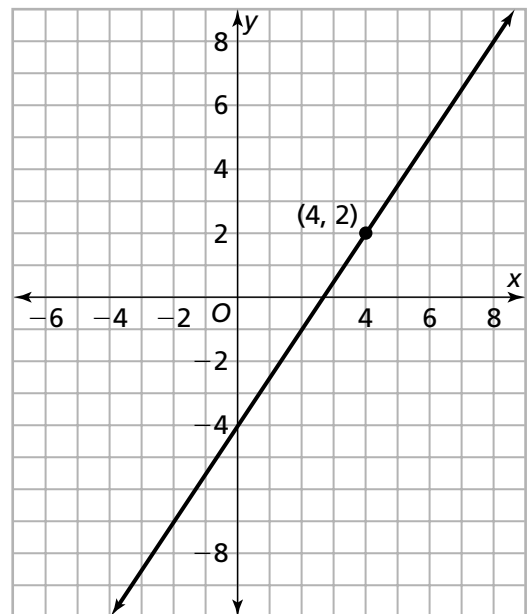
9. A middle school chorus has a party after their concert. The cost per person for this party depends on the number of members who attend. The following table shows some sample (*number attending, cost per person*) values.

Cost for Chorus Party

Number Attending	5	10	15	20	25	30
Cost per Person	$24	$12	$8	$6	$4.80	$4

Which of the following graphs shows best the relationship between number attending the party and cost per person, and how do you know?

a.

Cost per Person / Number Attending

b.

Cost per Person / Number Attending

c.

Cost per Person / Number Attending

d.

Cost per Person / Number Attending
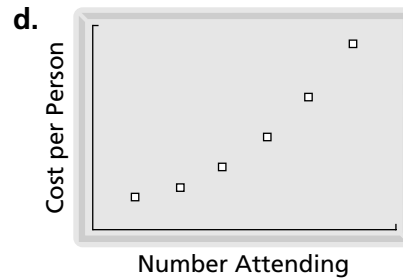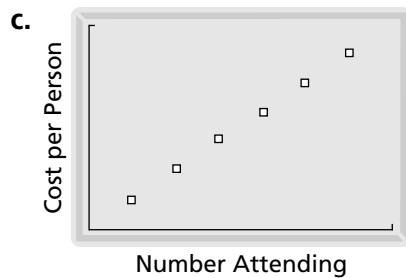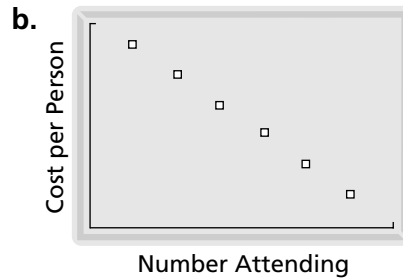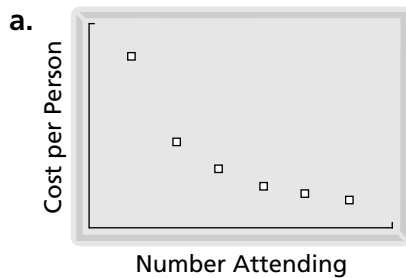
10. Jamal and Alisha played a round of miniature golf. They made some notes of the time it took to play. Their data are shown in the next table:

Hole Number	3	6	9	12	15	18
Time Since Start (min)	7	13	20	27	32	40

a. On grid paper, graph the (*hole number, time*) data. Be sure to give the graph a title, to label the graph axes, and to indicate the scale on each axis.

b. Describe the overall pattern of change you see in the graph and table.

c. Draw a graph model that fits the overall pattern.

d. Write an equation for the graph model.

e. Use your equation or graph model to estimate the time it took Jamal and Alisha to play the first 7 holes. Explain how you arrived at your estimate.

f. Use your equation or graph model to estimate the time it would take Jamal and Alisha to play 27 holes. Explain how you arrived at your estimate.

11. Two charter bus companies offer different pricing plans for a one-day school field trip. Badger Bus Line charges $75 for the driver and $1.25 per mile for the bus. Hawkeye Express charges $100 for the driver and $0.85 per mile for the bus.

a. Write equations showing how the cost of using each company will depend on the length of the field trip x in miles.

Badger Bus Line: $c =$

Hawkeye Express: $c =$

Write equations or inequalities matching the following questions. Then do the required calculations or solving to answer the questions.

b. For what distance will the cost of using Badger Bus Line be $250?

c. What will a 250-mile trip cost if a Hawkeye Express bus is used?

d. For what trip lengths can the school use Badger Bus if they have **at most** $300 to spend on transportation?

12. Ken and Barbie like to compete in long-distance bicycle races. When they were training for a 100-mile race, they did some calculations to see how increasing their average speed would change their race time.

a. Complete the following table.

100-Mile Races

Average Speed (mi/h)	5	10	15	20	25
Race Time (h)					

b. Write an equation showing how race time T depends on average speed s.

c. Explain how you know that the relationship between *race time* and *average speed* is **not** linear.

d. Compare the change in race time resulting from an increase of average speed from 5 miles per hour to 10 miles per hour to the change resulting from an increase of average speed from 15 to 20 miles per hour. Explain how the difference in those two values is illustrated by a graph of the equation relating *time* to *average speed*.