NAME _____ DATE _____

8–6 Functions Defined by Tables and Graphs

Objective: To understand what a function is and to define a function by using tables and graphs.

Vocabulary

Function A correspondence between two sets, the *domain* and *range*, that assigns to each member of the domain exactly one member of the range.

Example 1 State the domain and range of the function shown by the table. Then give the correspondence as a set of ordered pairs.

High school	Northern	Central	Eastern	Western	Southern
Number of teachers	65	52	49	98	80

Solution Domain = {Northern, Central, Eastern, Western, Southern}
Range = {49, 52, 65, 80, 98}
{(Northern, 65), (Central, 52), (Eastern, 49), (Western, 98), (Southern, 80)}

State the domain and range of each function shown by each table. Then give each correspondence as a set of ordered pairs.

1.

Animal	Antelope	Cheetah	Greyhound	Racehorse	Rabbit
Maximum speed (mi/h)	60	70	40	50	18

2. Inventory

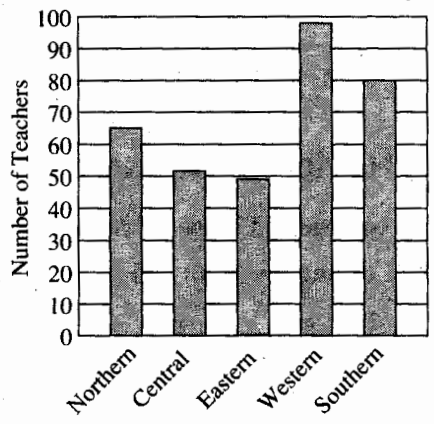
Item	Clock	Radio	Toaster	TV	Blender	Cookbook
Number	37	28	46	19	25	55

3. Electrical energy production

Year	1965	1970	1975	1980	1985
Billions of kilowatt-hours	1000	1500	2000	2250	2500

Example 2 Draw a bar graph for the function in the table in Example 1.

Solution Choose the horizontal axis for the members of the domain. List the members of the range along the vertical axis. For each member of the domain, draw a vertical bar to represent the corresponding value in the range of the function. Start the scale of the bars at zero, so that the relative lengths are correct.



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8–6 *Functions Defined by Tables and Graphs* *(continued)*

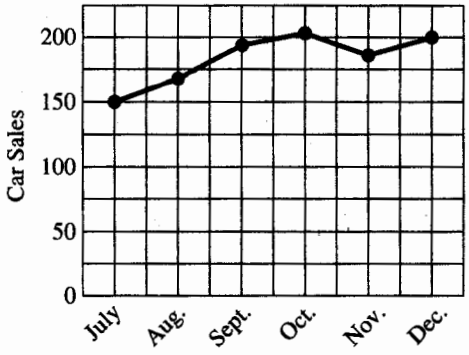
4–6. Draw a bar graph for the functions shown in each table in Exercises 1–3.

Example 3 Draw a broken-line graph for the function shown in the table.

Monthly car sales

Month	July	Aug.	Sept.	Oct.	Nov.	Dec.
Number of sales	150	170	195	205	185	200

Solution List the members of the domain along the horizontal axis. For each member of the domain plot a point to represent the corresponding value in the range of the function. Then connect the points by line segments.



Draw a broken-line graph for the function shown in each table.

7. Average monthly rainfall

Month	Apr.	May	June	July	Aug.	Sept.
Rainfall (mm)	60	50	85	78	40	52

8. Yearly profits

Year	Profit (in thousands)
1983	$200
1984	$215
1985	$236
1986	$270
1987	$300
1988	$350

9. Average monthly overtime

Month	July	Aug.	Sept.	Oct.	Nov.	Dec.
Hours of overtime	16	30	22	28	34	43

10. Average weekly pay

Year	1960	1965	1970	1975	1980	1985
Average weekly pay	$ 88	$122	$190	$289	$371	$386

Mixed Review Exercises

Write an equation in slope-intercept form of each line described.

1. passes through $(-1, 6)$ and $(-2, 10)$

2. slope -2; passes through $(-2, 1)$

3. slope $\frac{1}{2}$; y-intercept -4

4. passes through $(4, 5)$ and $(5, 0)$

Graph each equation.

5. $y = -2x + 1$ **6.** $x + y = 5$ **7.** $y = -\frac{1}{2}x + 4$ **8.** $x = -2$

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