

20. A man is running around a circular track 200 m in circumference. An observer uses a stopwatch to time each lap, obtaining the data in the following table.

- (a) What was the man's average speed (rate) between 68 s and 152 s?  
 (b) What was the man's average speed between 263 s and 412 s?  
 (c) Calculate the man's speed for each lap. Is he slowing down, speeding up, or neither?

Time (s)	Distance (m)
32	200
68	400
108	600
152	800
203	1000
263	1200
335	1400
412	1600

21. The table shows the number of CD players sold in a small electronics store in the years 1989–1999.

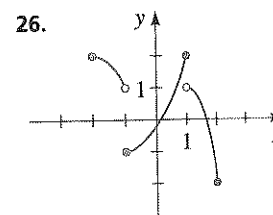
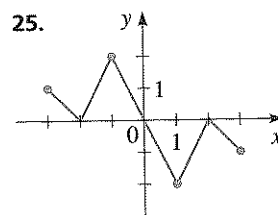
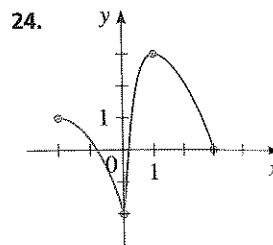
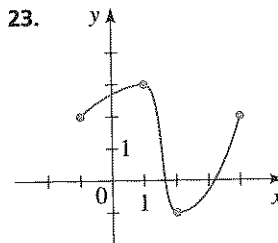
- (a) What was the average rate of change of sales between 1989 and 1999?  
 (b) What was the average rate of change of sales between 1989 and 1990?  
 (c) What was the average rate of change of sales between 1990 and 1992?  
 (d) Between which two successive years did CD player sales *increase* most quickly? *decrease* most quickly?

Year	CD players sold
1989	512
1990	520
1991	413
1992	410
1993	468
1994	510
1995	590
1996	607
1997	732
1998	612
1999	584

22. Between 1980 and 2000, a rare book collector purchased books for his collection at the rate of 40 books per year. Use this information to complete the following table. (Note that not every year is given in the table.)

Year	Number of books
1980	420
1981	460
1982	
1985	
1990	
1992	
1995	
1997	
1998	
1999	
2000	1220

23–26 ■ The graph of a function is given. Determine the intervals on which the function is increasing and on which it is decreasing.



27–34 ■ A function  $f$  is given.

- (a) Use a graphing device to draw the graph of  $f$ .  
 (b) State approximately the intervals on which  $f$  is increasing and on which  $f$  is decreasing.

27.  $f(x) = x^{2/5}$

28.  $f(x) = 4 - x^{2/3}$

29.  $f(x) = x^2 - 5x$

30.  $f(x) = x^3 - 4x$

31.  $f(x) = 2x^3 - 3x^2 - 12x$

32.  $f(x) = x^4 - 16x^2$

33.  $f(x) = x^3 + 2x^2 - x - 2$

34.  $f(x) = x^4 - 4x^3 + 2x^2 + 4x - 3$