

71. (a) -3 (b) -2 (c) 0 (d) 2

72. (a) 3 (b) 3 (c) 3 (d) 3

73. (a) $[4, \infty)$ (b) $(-\infty, -1]$

(c) $[-1, 4]$

74. (a) $(-\infty, 1]$ (b) $[4, \infty)$

(c) $[1, 4]$

75. (a) $(-\infty, 4]$ (b) $[4, \infty)$

(c) none

76. (a) none (b) $(-\infty, \infty)$

(c) none

77. (a) none (b) $(-\infty, -2]; [3, \infty)$

(c) $(-2, 3)$

78. (a) $(3, \infty)$ (b) $(-\infty, -3)$

(c) $(-3, 3]$

79. (a) yes (b) $[0, 24]$

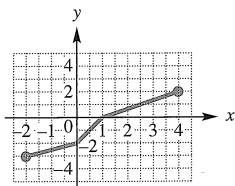
(c) 1200 megawatts

(d) at 17 hr or 5 P.M.; at 4 A.M.

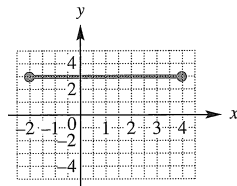
(e) $f(12) = 2000$; At 12 noon, electricity use is 2000 megawatts.

(f) increasing from 4 A.M. to 5 P.M.; decreasing from midnight to 4 A.M. and from 5 P.M. to midnight

71.

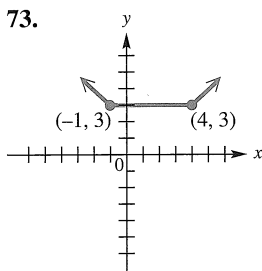


72.

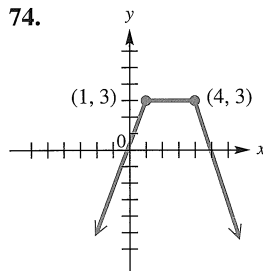


Determine the intervals of the domain for which each function is (a) increasing, (b) decreasing, and (c) constant. See Example 10.

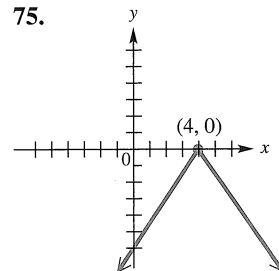
73.



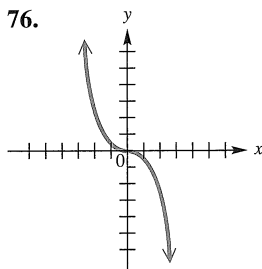
74.



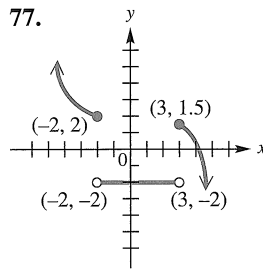
75.



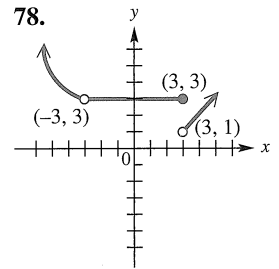
76.



77.

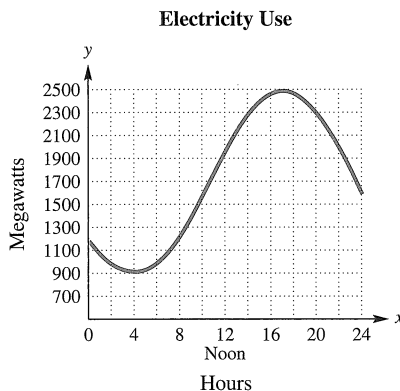


78.



Solve each problem by obtaining information from the associated graph. See Example 11.

79. **Electricity Usage** The graph shows the daily megawatts of electricity used on a record-breaking summer day in Sacramento, California.



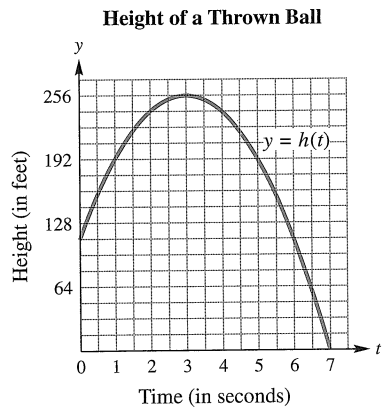
Source: Sacramento Municipal Utility District.

- Is this the graph of a function?
- What is the domain?
- Estimate the number of megawatts used at 8 A.M.
- At what time was the most electricity used? the least electricity?
- Call this function f . What is $f(12)$? What does it mean?
- During what time intervals is electricity usage increasing? decreasing?

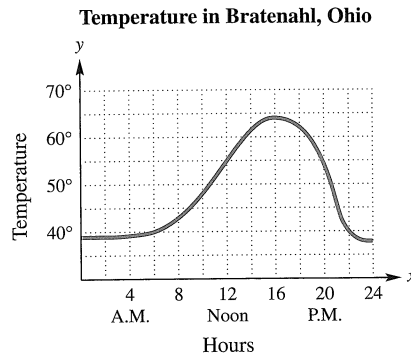
(c) 240 ft (b) at 1 sec and at
(c) from 0 to 3 sec; from
sec (d) 256 ft; at 3 sec
7 sec 81. (a) about
on to about 8 P.M. (b) from
light until about 6 A.M. and
10 P.M. (c) about 10 A.M.
10 P.M. 82. (a) 24 units
from 0 to 2 hr after it is taken;
2 to 12 hr after it is taken
hr; 64 units (d) 8 hr

80. **Height of a Ball** A ball is thrown straight up into the air. The function defined by $y = h(t)$ in the graph gives the height of the ball (in feet) at t seconds. (Note: The graph does not show the path of the ball. The ball is rising straight up and then falling straight down.)

- What is the height of the ball at 2 sec?
- When will the height be 192 ft?
- During what time intervals is the ball going up? down?
- How high does the ball go, and when does the ball reach its maximum height?
- At how many seconds does the ball hit the ground?



81. **Temperature** The graph shows temperatures on a given day in Bratenahl, Ohio.



- At what times during the day was the temperature over 55° ?
- When was the temperature below 40° ?
- Greenville, South Carolina, is 500 mi south of Bratenahl, Ohio, and its temperature is 7° higher all day long. At what time was the temperature in Greenville the same as the temperature at noon in Bratenahl?

82. **Drug Levels in the Bloodstream** When a drug is taken orally, the amount of the drug in the bloodstream at t hours is given by the function defined by $y = f(t)$, as shown in the graph.

- How many units of the drug are in the bloodstream at 8 hr?
- During what time interval is the drug level in the bloodstream increasing? decreasing?
- When does the level of the drug in the bloodstream reach its maximum value, and how many units are in the bloodstream at that time?
- When the drug reaches its maximum level in the bloodstream, how many additional hours are required for the level to drop to 16 units?

