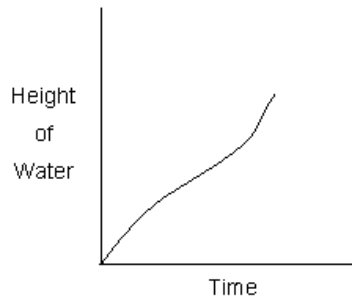
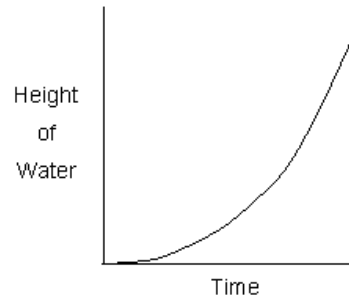


3: Applications of Graphs --- Answers

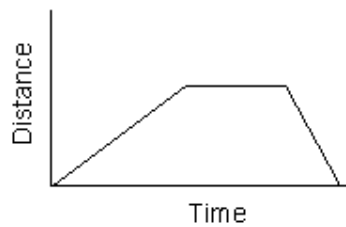
1. a)



b)



2.



3.

- a) The person started about 4 feet away from the motion detector and walked away at a constant rate about 4 feet. Then the person stopped for about 4 seconds before continuing walking away at the same constant rate. The person then stopped for a few seconds again before walking toward the detector, speeding up after about one second to nearly a constant rate.
- b) The person started about 7 feet away and walked toward the detector at a slightly increasing rate. When about 2 feet from the detector, the person turned and moved away, speeding up, then at a more constant rate, until he or she was about 12 feet away. Then the person again walked toward the detector, turning when about 2 feet away. The person immediately walked away at a constant rate until he or she was about 16 feet away, then back at a constant rate. At about 2 feet from the detector the person turned once again and walked away.

4. At about 8:00 am it starts to go down.

5. Answers will vary

6. A. ii; B. i; C. iv; D. iii

7.

- a) i
- b) iii
- c) iv
- d) ii
- e) v
- f) vi

8. d

9. d

10. a and c

11.

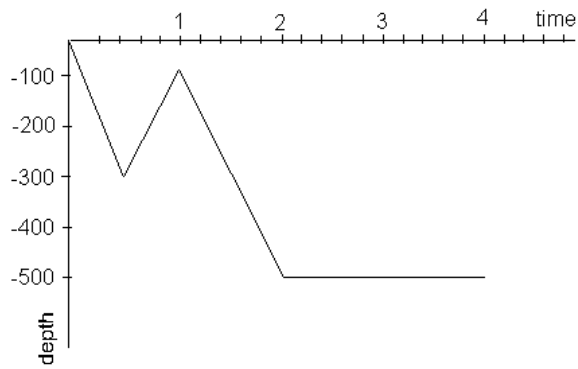
- a) (vertically shifted down 1 unit) D: $0 \leq x \leq 14$; R: $-1 \leq y \leq 9$
- b) (horizontally shifted right 1 unit) D: $1 \leq x \leq 15$; R: $0 \leq y \leq 10$
- c) (vertically stretched by a factor of 2) D: $0 \leq x \leq 14$; R: $0 \leq y \leq 20$
- d) (vertically shifted up 2 units) D: $0 \leq x \leq 14$; R: $2 \leq y \leq 12$
- e) (vertically compressed by a factor of 2) D: $0 \leq x \leq 14$; R: $0 \leq y \leq 5$
- f) (horizontally stretched by a factor of 2) D: $0 \leq x \leq 28$; R: $0 \leq y \leq 10$
- g) (horizontally compressed by a factor of 2) D: $0 \leq x \leq 7$; R: $0 \leq y \leq 10$

12. .

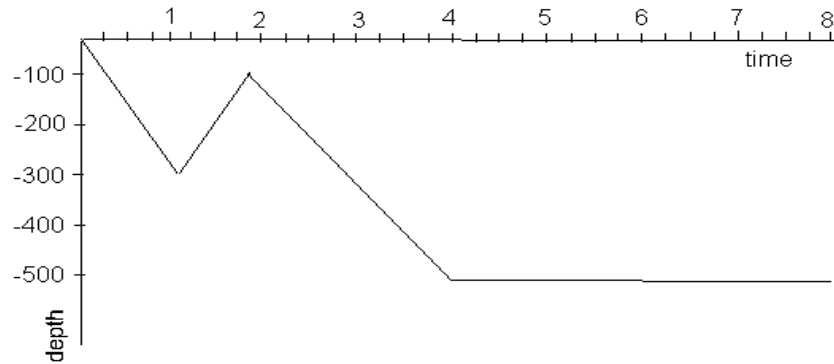
- a) Start 4 feet away from the motion detector. Stand still for 3 seconds. Step 6 feet away from the starting point, stepping 3 feet each second. Stand still for 1 second. Walk toward the motion detector for 4 seconds, moving 3 feet each second, ending 2 feet behind the motion detector. Step 1 foot away from the motion detector (stepping 3 feet per second). Stand still for the remaining 4 seconds.
- b) Start 2 feet away from the motion detector. Stand still for 3 seconds. Step 2 feet away from the starting point, stepping 1 foot each second. Stand still for 1 second. Walk toward the motion detector for 4 seconds, moving 1 foot each second. Step 1 foot away from the motion detector (stepping 1 foot per second). Stand still for the remaining 4 seconds.
- c) Start at time = 1 second. Start 6 feet away from the motion detector. Stand still for 3 seconds. Step 6 feet away from the starting point, stepping 3 feet each second. Stand still for 1 second. Walk toward the motion detector for 4 seconds, moving 3 feet each second. Step 3 feet away from the motion detector (stepping 3 feet per second). Stand still for the remaining 4 seconds, ending at time = 16 seconds.
- d) Start 6 feet away from the motion detector. Stand still for 1 second. Quickly step 6 feet away from the starting point, stepping 6 feet in $\frac{2}{3}$ second. Stand still for $\frac{1}{3}$ second, until time = 2 seconds. Walk to the motion detector for $\frac{4}{3}$ seconds, moving 12 feet in the $1\frac{1}{3}$ seconds. Step 3 feet away from the motion detector (stepping 3 feet in $\frac{1}{3}$ second). Stand still for the remaining $1\frac{1}{3}$ seconds, until time = 5 seconds (whew!).

13.

a)



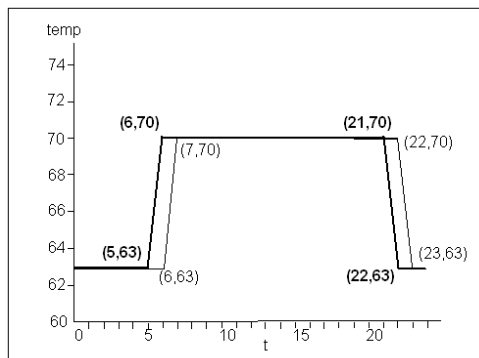
b)



The graph $y = s(1/2t)$ is horizontally stretched by a factor of 2. Thus the sub took twice as long for each maneuver.

14.

a)



You will sketch the graph shifted left 1 unit.

b) The new graph $w = h(t + 1)$.