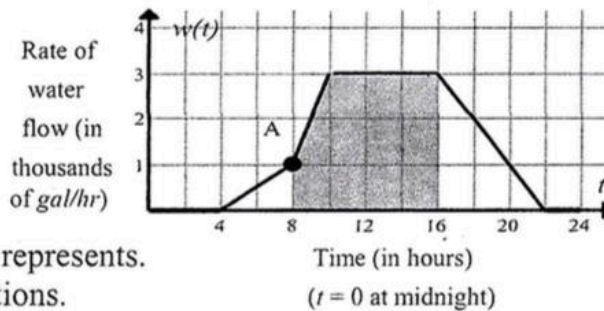


Assignment 8-1

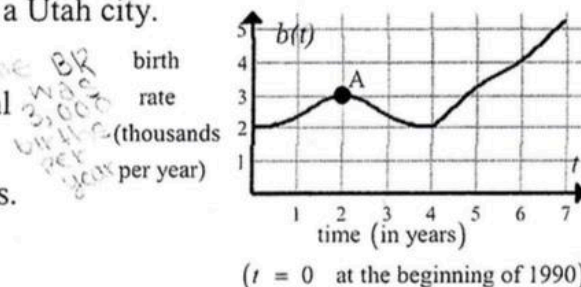
1. The graph at the right represents the rate of flow of irrigation water (in thousands of gallons/hour) from a reservoir during a 24 hour period.



- Write a sentence telling what Point A represents.
- Find the shaded area. Show computations.
- Write a sentence telling what the shaded area represents. Include numbers and units.
- Set up an integral which represents the total amount of water released from the reservoir during the day shown.
- Find the value of the integral in Part d.

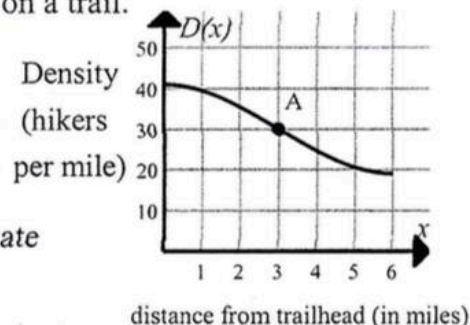
2. The graph at the right models the birth rate in a Utah city.

- Tell what Point A represents.
- Approximate $\int_2^8 b(t) dt$ using geometrical shapes. Show computations.
- Tell what your answer to Part b. represents.
- When was the birth rate the lowest, and what was the birth rate at that time?



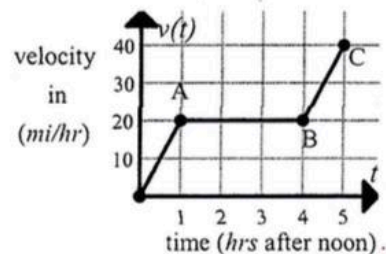
3. The graph at the right represents the density of hikers on a trail.

- Tell what Point A represents.
- $\int_0^3 D(x) dx = 110$. Write a sentence with numbers and units stating what this represents.
- If $D'(3) = -6$, use local linearization to approximate the density of hikers 3.1 miles from the trailhead.

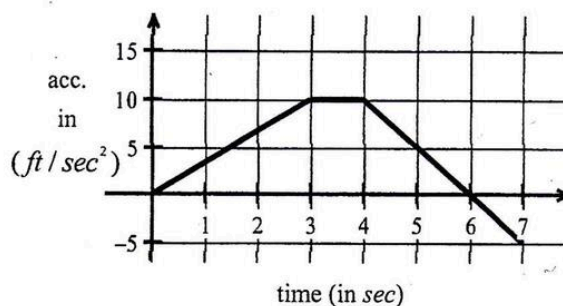


4. The graph at right models velocity.

- Tell what Point A represents.
- Tell what the slope between B and C represents.
- What is the velocity at 12:15? at 5:00?
- What is the acceleration at 12:30? at 2:00?
- What distance is traveled between noon and 5:00?



5. The graph at right models acceleration
- What is the acceleration at $t = 2 \text{ sec}$?
 - When is the acceleration 10 ft/sec^2 ?
 - What is the minimum acceleration?
 - If the initial velocity is zero, what is the velocity at $t = 6 \text{ sec}$?
 - If the initial velocity is 20 ft/sec , what is the velocity at $t = 6 \text{ sec}$?
 - If the initial velocity is 20 ft/sec , what is the velocity at $t = 7 \text{ sec}$?



For Problems 14-18, find the average value of each function on the given interval.

6. No calculator.

$$f(x) = x^3 \text{ on } [0, 2]$$

7. No calculator.

$$g(t) = \frac{1}{(t-1)^2} \text{ on } [2, 5]$$

8. No calculator.

$$f(y) = 2y - \sqrt{y} \text{ on } [1, 4]$$

9. Use a calculator.

$$f(t) = \frac{t^2 - 1}{\sqrt{t} + 1} \text{ on } [.4, 3.2]$$

10. Use a calculator.

$$h(x) = .5^x \text{ on } [-2, 1]$$

11. Find the exact x -value where the function in Problem 6 equals its average value.
12. Use a calculator to solve for c for the equation $h(c) = h_{\text{avg}}$ in Problem 10. Your answer should be expressed to 3 or more decimal place accuracy.