

1. Suppose \$20,000 is invested in a 10-year certificate of deposit (CD). The function  $A$  shown below outputs the dollar value of the CD after  $t$  years.

$$A(t) = 20\,000e^{0.077t}$$

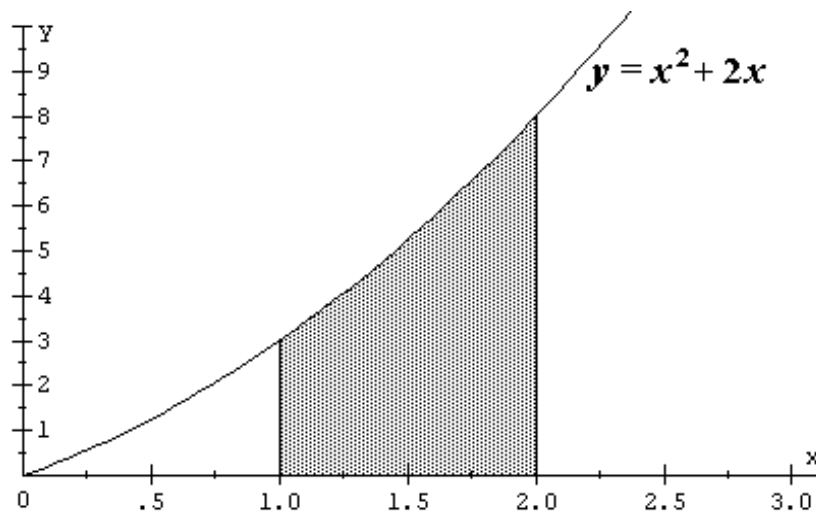
- 1a. Find the value of the CD after 5 years. \$

- 1b. Write the formula for the rate of change function  $A'(t) =$

- 1c. Use your results from Part 1b to evaluate  $A'(5)$ .

Interpret this value in the context of the problem using a complete sentence.

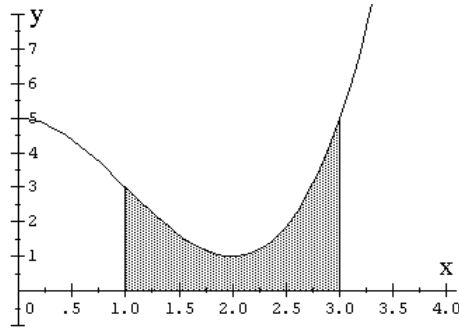
2. Consider the region shaded in the following graph.



Write an expression that can be used to find the area of the region.

$$\text{area} = \int_{\quad}^{\quad} \underline{\hspace{2cm}} dx$$

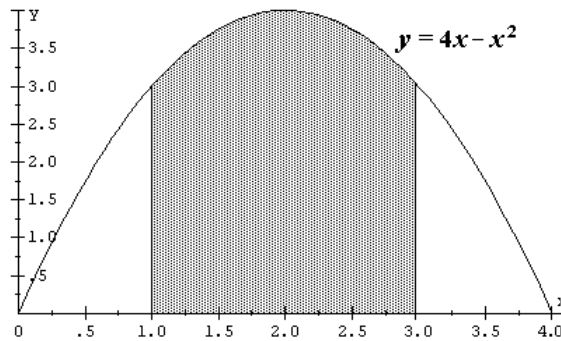
3. Consider the region shaded in the following graph, which shows the curve  $f(x) = x^3 - 3x^2 + 5$ .



Write an expression that can be used to find the area of the region. Do not evaluate.

$$\text{area} = \int_{\underline{\quad}}^{\underline{\quad}} \underline{\hspace{2cm}} dx$$

4. Consider the region shaded in the following graph.



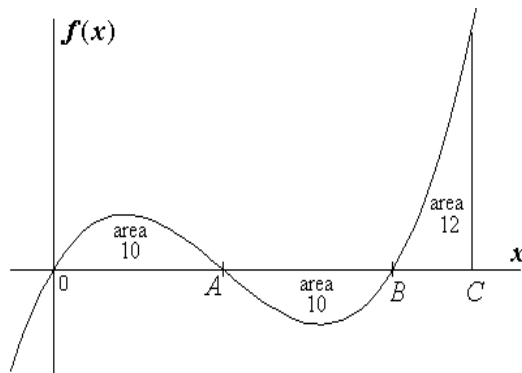
Write an expression that can be used to find the area of the region.

$$\text{area} = \int_{\underline{\quad}}^{\underline{\quad}} \underline{\hspace{2cm}} dx$$

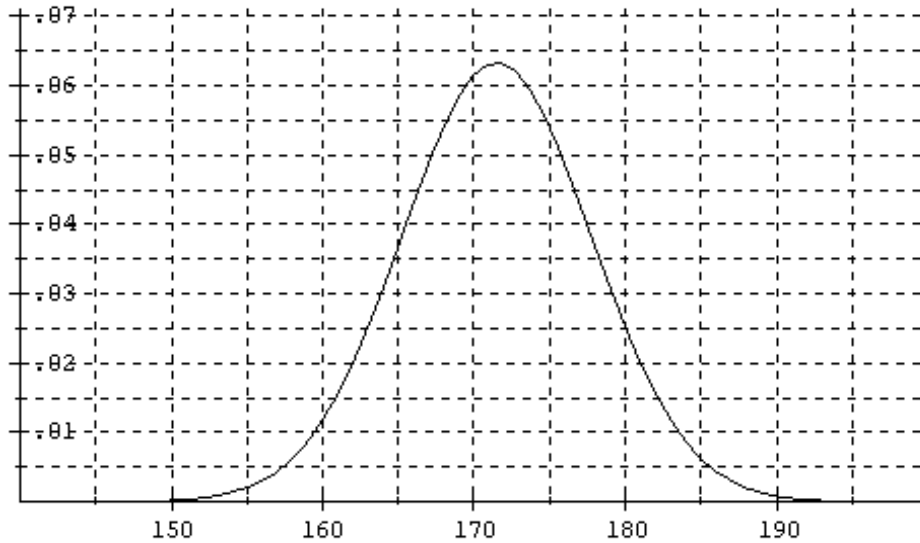
5. Use the graph of the function  $f$  shown below to answer the following questions. Justify your answers.

5a.  $\int_0^B f(x) dx$

5b.  $\int_A^C f(x) dx$



6. The following density function shows the distribution of adult male weights in the United States in pounds.



6a. In this figure, each rectangular grid block has area equal to

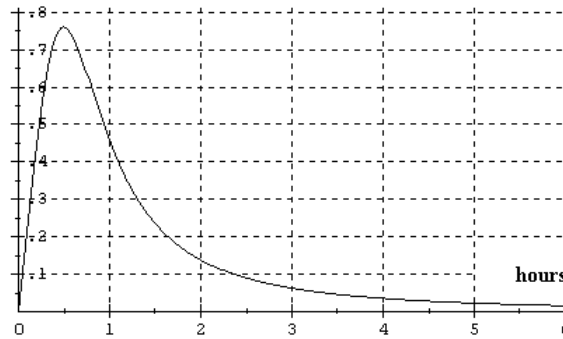
$$\text{area} = (\text{length})(\text{width}) = (\underline{\hspace{1cm}})(\underline{\hspace{1cm}}) = \boxed{\hspace{1cm}} \text{ square units}$$

6b. What percentage of adult males in the U.S. weigh less than 160 lb?  %  
 (Hint: Each grid block in the graph has an area of 0.025 square units.)

6c. What percentage of adult males in the U.S. weigh more than 180 lb?  %

6d. What is the *median* weight of adult males in the U.S.? (Half weigh more and half weigh less.)  lb

7. The following density function shows the distribution of the amount of time (in hours) that college students spend using the Internet each day.



7a. In this figure, each rectangular grid block has area equal to

$$\text{area} = (\text{length})(\text{width}) = (\underline{\hspace{1cm}})(\underline{\hspace{1cm}}) = \boxed{\hspace{1cm}} \text{ square units}$$

7b. What percentage of college students use the Internet more than 2 hours per day?

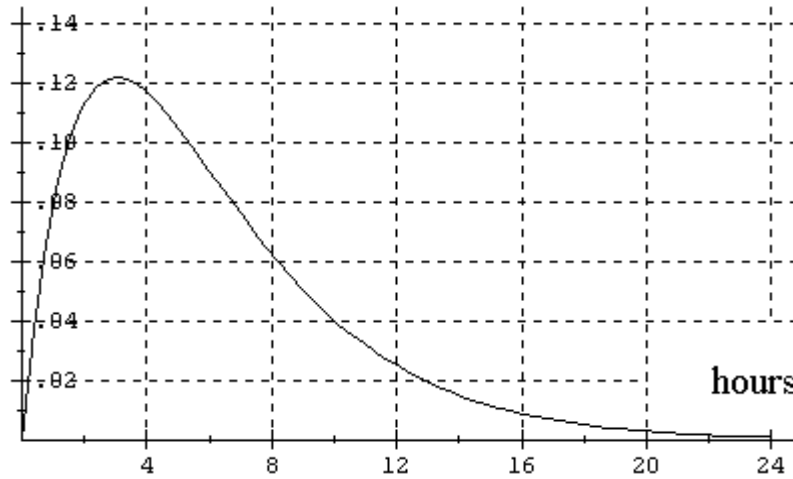
$$\boxed{\hspace{1cm}} \% \text{ (Hint: Each grid block in the graph has an area of 0.1 square units.)}$$

7c. What percentage of college students use the Internet between 1 and 2 hours per day?

$$\boxed{\hspace{1cm}} \%$$

7d. What is the *median* amount of time college students spend using the Internet each day?  $\boxed{\hspace{1cm}}$  hr.

8. The following density function shows the distribution of the amount of time (in hours) that Americans leave their TVs on each day.



8a. In this figure, each rectangular grid block has area equal to

$$area = (length)(width) = (\underline{\hspace{2cm}})(\underline{\hspace{2cm}}) = \boxed{\hspace{2cm}} \text{ square units}$$

8b. What percentage of Americans leave their TVs on more than 8 hours per day?

$$\boxed{\hspace{2cm}} \% \text{ (Hint: Each grid block in the graph has an area of 0.08 square units.)}$$

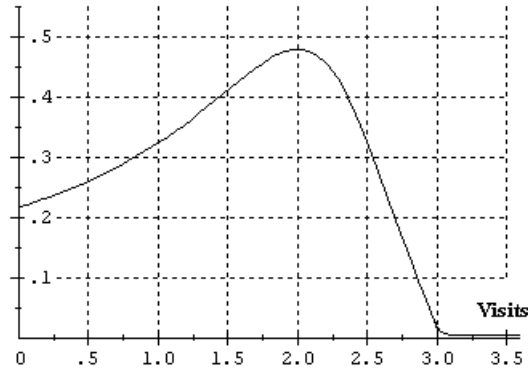
8c. What percentage of Americans leave their TVs on less than 4 hours per day?

$$\boxed{\hspace{2cm}} \%$$

8d. What is the *median* amount of time Americans leave their TVs on each day?

$$\boxed{\hspace{2cm}} \text{ hr.}$$

9. The following density function shows the distribution of the number of visits that Americans make to the dentist each year.



9a. In this figure, each rectangular grid block has area equal to

$$\text{area} = (\text{length})(\text{width}) = (\underline{\hspace{1cm}})(\underline{\hspace{1cm}}) = \boxed{\hspace{1cm}} \text{ square units}$$

9b. What percentage of Americans visit the dentist less than one time per year?

$$\boxed{\hspace{1cm}} \% \text{ (Hint: Each grid block in the graph has an area of 0.05 square units.)}$$

9c. What percentage of Americans visit the dentist more than two times per year?

$$\boxed{\hspace{1cm}} \%$$

9d. What is the *median* number of times Americans visit the dentist per year?

$$\boxed{\hspace{1cm}}$$