

Name

14-4

Lesson Master

Questions on SPUR Objectives  
See Student Edition pages 862–865 for objectives.

SKILLS

Objective B

1. a. Use geometry formulas to evaluate  $\int_1^3 2x \, dx$  and  $\int_1^3 -5 \, dx$ . \_\_\_\_\_
- b. Use your answer to Part a to evaluate  $\int_1^3 (2x - 5) \, dx$ . \_\_\_\_\_
2. Suppose  $f$  is a continuous function,  $\int_0^{10} f(x) \, dx = 124$ , and  $\int_7^{10} f(x) \, dx = 37$ . Evaluate.
- a.  $\int_0^{10} 6f(x) \, dx$  \_\_\_\_\_
- b.  $\int_0^7 f(x) \, dx$  \_\_\_\_\_
- c.  $\int_7^{10} -2f(x) \, dx$  \_\_\_\_\_

PROPERTIES

Objective C

In 3–7, rewrite each expression as a single integral.

3.  $\int_{-4}^5 g(x) \, dx + \int_5^{13} g(x) \, dx$  \_\_\_\_\_
4.  $\int_0^{25} \log(3x) \, dx - \int_5^{25} \log(3x) \, dx$  \_\_\_\_\_
5.  $\int_3^{12} 3x^2 \, dx + \int_3^{12} 5x^2 \, dx$  \_\_\_\_\_
6.  $16\int_1^9 p(x) \, dx + 7\int_1^9 q(x) \, dx$  \_\_\_\_\_
7.  $2\int_0^1 x^4 \, dx + 4\int_0^1 2x^3 \, dx - 5\int_0^1 x^2 \, dx + \int_0^1 3x \, dx - \int_0^1 12 \, dx$  \_\_\_\_\_

USES

Objective F

8. After completing a big renovation project, the crew at an oceanarium is refilling the dolphin pool. Two pumps are working to fill the pool. The rates  $p_1(t)$  and  $p_2(t)$  of water flow for each pump in thousands of gallons per hour are given in the table at the right. The variable  $t$  is measured in hours after starting to fill the pool.
- a. Use integral notation to write an expression for the total amount of water pumped into the pool over a 24-hour period. Write your answer as a single integral.
- \_\_\_\_\_
- b. Estimate the integral you wrote in Part a by calculating an appropriate Riemann sum, using 12 subintervals and the left endpoint of each subinterval as the intermediate values.
- \_\_\_\_\_
- c. Suppose the pool holds 50 million gallons of water. After 24 hours, what percent of the pool will be full?
- \_\_\_\_\_

$t$	$p_1(t)$	$p_2(t)$
0	516.00	713.75
2	515.25	713.90
4	515.50	713.40
6	515.20	713.15
8	514.95	713.35
10	514.50	712.90
12	514.75	713.00
14	515.00	712.75
16	514.50	712.90
18	514.35	712.75
20	513.95	713.05
22	514.25	712.85
24	514.50	712.50