**Calculus Spring Exam Review**

# Formulas

   

 

 = -ln+ C  = ln+ C

= ln+ C = -ln+ C

 = 

**Chapter 4**

1. Use the properties of sigma notation and the above summation formulas to evaluate the sum: 

2. (SKIP) Write the definite integral that represents the shaded region.

3. Draw a sketch representing 

4. If , , and find each using properties of the definite integral.

a) Find  b) Find 

5. Find the average value of on the interval [0, 2].

6. Find *f(x)* if , , 

7. Use feet per second squared as the acceleration due to gravity. A ball is thrown vertically upward from the ground with an initial velocity of 56 feet per second. For how many seconds will the ball be going upward?

8. Use the Trapezoidal Rule with n = 4 to approximate 

9. Evaluate the following integrals by hand (not with a calculator). Give an EXACT value (decimal approximations are not acceptable) for definite integrals.

a. 

b. 

c. 

d. 

e. 

f. 

g. 

h. (SKIP)

i. 

j. 

k. 

l. 

m. 

n. 

o. 

p. SKIP

**Chapter 5**

10. Find y′.

a. 

b. y = 

c. 

d. 

e. 

f. 

g. j(x) = cos3(2x)

h. 

i. 

j. y = 3xx3

11. Evaluate.

a. 

b. 

c. 

d. 

e. 

f. 

g. 

h. 

i. 

12. Find the general solution to the first order differential equation: (4-x)dy + 2ydx = 0.

13. A certain type of bacteria increases continuously at a rate proportional to the number present. If there are 500 present at a given time and 1000 present 2 hours later, how many will there be 5 hours from the initial time given?

**Chapter 7**

14. Determine the area of the region bounded by the graphs of y = -x2 + 2x + 3 and y = 3.

15. Find the area of the two regions bounded by y = 3 – x2, y = 3 – x, and x = -2.

16. Find the volume of the solid formed by revolving the region bounded by the graphs of y = x3, x = 2, and y = 1 about the y-axis.

17. What integral represents the volume of the solid formed by revolving the region bounded by the graphs of y = x3, y = 1, and x = 2 about the line y = 10?

18. Find the volume of the solid formed by revolving the region bounded by the graphs of y =  and y = 2 about the y-axis.

19. Find the volume of the solid formed by revolving the shaded region enclosed by

y = , y = , and x = 4 about the line y = 4.

20. Let R be the region bounded by f(x) = x2 and y = 2.

a. Sketch the region R.

b. Find the area of R.

c. Revolve R around the x-axis and find the volume of the solid generated.

Cross section**s**