Key

Review 2

Chapter Test Version A-A

True/False

1. If you partition the interval [4, 8] with 8 subintervals of equal size, then each subinterval has a width of 1/2. T $\frac{8-4}{8} = \frac{4}{8} = \frac{1}{2}$

Skip ~~2.~~ The sum 1/3 + 2/3 + 3/3 + 4/3 can be expressed as $\sum_{k=1}^{4} k/3$. T

3. $\int_a^b f(x)\,dx = \int_b^a f(x)\,dx$. F should have $-\int$

Skip ~~4.~~ The marginal cost for a product is $\overline{MC} = 6x + 3$. The total cost of production of 100 units is \$400.00. The total cost function is then $C(x) = 3x^2 + 3x + 50$. F

Skip ~~5.~~ $\int \sin^3 x \cos x\,dx = \frac{\sin^4 x}{4} + C$. T

Multiple Choice/Free Response

1. Let $y = 5x - x^2$. Approximate the area under the graph of y and above the x - axis from $x = 0$ to $x = 2$ using LR_4.

   a. 5.75 b. 6.75 c. 7.75 d. 8.75

2. For $y = x^3 + x^2 - x + 4$, compute the area under the graph of y and above the x - axis from $x = -1$ to $x = 1$ using RR_5.

   a. 8.47 b. 8.52 c. 8.6667 d. 8.72

Skip ~~3.~~ Simplify $\sum_{k=1}^{n} (k^2 + 3k - 5)$ to obtain a formula with variable, n.

   a. $(n^3 + 6n^2 - 10n)/3$ b. $(n^3 - 3n^2 + 8n)/3$
   c. $(n^3 - 3n^2 - 19n)/3$ d. $(n^3 - 6n^2 - 19n)/3$

Skip ~~4.~~ Let $\sum_{k=1}^{n} a_k = +4$ and $\sum_{k=1}^{n} b_k = -7$. Find $\sum_{k=1}^{n} (4a_k - 3b_k)$.

   a. -5 b. 15 c. 21 d. 37

Skip ~~5.~~ Express $\lim_{\|P\| \to 0} \sum_{k=1}^{n} (4c_k^3 + 3c_k^2 + 7)\,\Delta x_k$ as a definite integral on the interval [-1, 3] .

6. Use FnInt or RAM to find $\int_2^3 3/x^2\,dx$.

   .5 .4999780 9 or $RRAM_2 = .41$

7. $\int 2x^3 - 5x^2 + 6x \, dx =$

a. $x^4/4 - 5x^3/3 + 6x^2 + C$
b. $x^4/2 - 5x^3/3 + 6x^2 + C$
c. $6x^2 - 10x + 6 + C$
d. $x^4/2 - 5x^3/3 + 3x^2 + C$

8. Suppose $\int_0^2 f(x)\,dx = 7$, $\int_2^5 f(x)\,dx = 4$, and $\int_0^5 g(x)\,dx = 3$.
Which of the following statements, if any, are true?

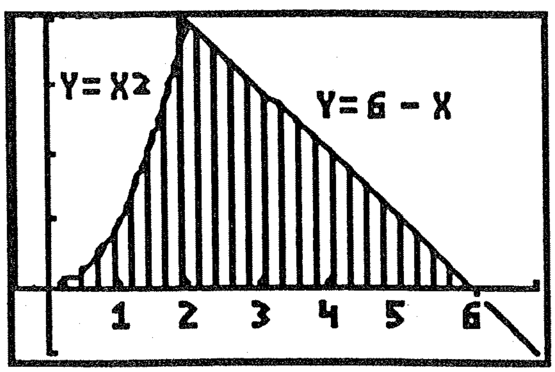
a. $\int_0^5 [f(x) - g(x)]\,dx = 8$
b. $\int_0^5 [f(x) + g(x)]\,dx = 10$
c. $\int_0^5 [f(x) + g(x)]\,dx = 14$
d. $\int_5^2 f(x)\,dx = -4$

use rules of Integration!

9. Find $\int_0^6 (2x^2 - 9x + 4)\,dx$. ~~Support with an FnInt computation or the RAM program.~~

a. 0
b. 3
c. 6
d. 18

10. Find the area of the shaded region.



a. 32/3
b. 20/3
c. 16/3
d. 10/3

11. Evaluate the integral $\int_{-2}^{3} (2 - 3x)^2\,dx$. Support with **FnInt**.

a. 90
b. 95
c. 100
d. 105

12. The $\int K(x)\,dx = 3 \sin x - 5 \cos x + C$. Find K(x).

a. $3 \cos x - 5 \sin x$
b. $3 \cos x + 5 \sin x$
c. $3 \sin x + 5 \cos x$
d. $3 \sin x - 5 \cos x + x$

13. Solve the initial value problem for y as a function of x given: $dy/dx = 2x - 6$ with an initial condition of $y = 4$ when $x = 1$.

a. $y = x^2/2 - 6x + 9$ b. $y = x^2/2 - 6x - 1$ c. $y = x^2 - 6x - 1$ d. $y = x^2 - 6x + 9$

Skip ~~14.~~ An object is thrown upward. After 1 second its velocity is 60 ft per sec. Find its velocity after 4 sec. (Hint: Because of gravity the acceleration of a falling body is 32 ft per sec, if we do not consider air resistance.)

a. - 100 ft/sec b. - 36 ft/sec c. 82 ft/sec d. 92 ft/sec

Skip ~~15.~~ Evaluate $\int -6/(2x + 1)^4 \, dx$.

a. $3/(2x + 1)^3 + C$ b. $3/(2x + 1)^5 + C$ c. $1/(2x + 1)^3 + C$ d. $1/(2x + 1)^5 + C$

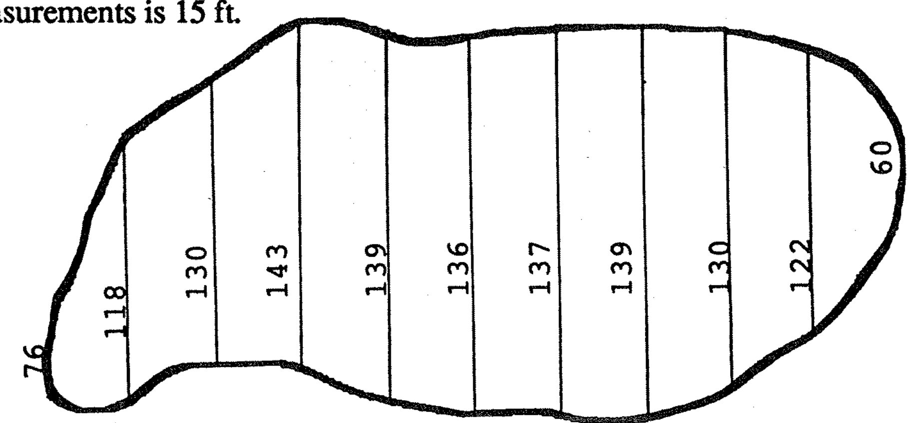
Skip ~~16.~~ Evaluate $\int_2^3 x^2/\sqrt{x^3 - 5}\, dx$ to 5 decimal places. Support with the **FnInt** computation.

a. 1.85717 b. 1.97224 c. 2.33613 d. 2.73021

17. Under ideal laboratory conditions a certain bacteria has a population of 7500 after 2 hours of growth. At the end of 6 hours there are 30,000. How many bacteria were there at the start of the growth process?

a. 3750 b. 4250 c. 5500 d. 6000

18 Find the area of the region given below by the Trapezoidal Rule. The spacing between measurements is 15 ft.



a. 18,240 b. 18,930 c. 19,200 d. 19,680 e. 20,800

Skip ~~19.~~ Find the area of the region in #18 by Simpson's Rule. Select your answer from a - e in #18. C

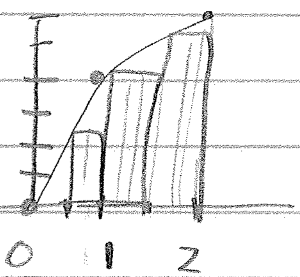
Skip ~~20.~~ Express the sum $5 + 1 + 1/5 + 1/25 + 1/125$ in sigma notation. ____________

$\sum_{K=0}^{4} \frac{5}{5^K}$ Also $\sum_{K=1}^{5} 5^{2-K}$

Chapter 5 Test Version A-A

MC/Free Response

1.

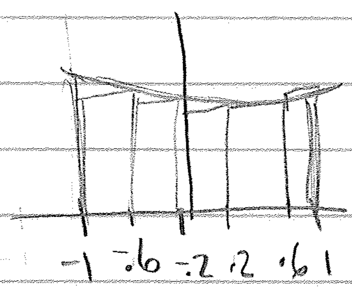


4 Rect

$= \frac{1}{2}(0 + 2.25 + 4 + 5.25)$

$= \boxed{5.75}$

2.



$b = \frac{1 - -1}{5} = \frac{2}{5}$

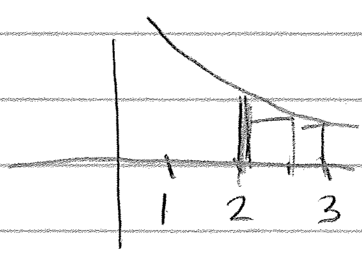
$= \frac{2}{5}(4.744 + 4.232 + 3.848 + 3.976 + 5)$

$= \boxed{8.72}$

6. fnInt → Math, 9, fnInt($\frac{3}{x^2}$, x, 2, 3) = .5

RAM

could be RRAM MRAM LRAM + n=? I used 2.



n=2

RRAM

$= \frac{1}{2}(.48 + .\bar{3})$

$= .406..$

$(2-3x)(2-3x)$

11. $\int_{-2}^{3} (2-3x)^2\,dx = \int_{-2}^{3} (4-12x+9x^2)\,dx$

$= 4x - 6x^2 + 3x^3 \Big|_{-2}^{3} = (4\cdot 3 - 6\cdot 3^2 + 3(3)^3) - (4\cdot -2 - 6(-2)^2 + 3(-2)^3)$

$= (12 - 54 + 81) - (-8 - 24 - 24)$

$= 39 - {}^-56$

$= \boxed{95}$

12. $\int k(x)\,dx = 3\sin x - 5\cos x + C$

$= \frac{dy}{dx}(3\sin x - 5\cos x + C)$

$= \boxed{3\cos x + 5\sin x} + 0$

13. $\frac{dy}{dx} = 2x - 6$ initial: $y=4,\ x=1$

$\int (2x-6)\,dx = x^2 - 6x + C$

$4 = (1)^2 - 6(1) + C$

$4 = 1 - 6 + C$ $\boxed{x^2 - 6x + 9}$

$4 = -5 + C$

$9 = C$

17. $y = ab^x$ | $30{,}000 = 7500\,b^4$ | $y = 7500(4^{1/4})^{-2}$

$4 = b^4$ | $y = 3750$

$b = 4^{1/4}$

18. $T = \frac{15}{2}(76 + 2\cdot 118 + 2\cdot 130 + 2\cdot 143 + 2\cdot 139 + 2\cdot 136 + 2\cdot 137 + 2\cdot 139 + 2\cdot 130 + 2\cdot 122 + 60)$

$= \boxed{18{,}930}$

7. $\frac{2x^4}{4} + \frac{5x^3}{3} + \frac{6x^2}{2} + C$

$\frac{x^4}{2} + \frac{5x^3}{3} + 3x^2 + C$ $\boxed{d}$

8. a) $\int_0^5 f(x) - \int_0^5 g(x)$

$\int_0^2 f(x) + \int_2^5 f(x) - \int_0^5 (gx)$

$7 + 4 - 3 = 8$ True

b) $\int_0^5 f(x) + \int_0^5 g(x)$

$\int_0^2 f(x) + \int_2^5 f(x) + \int_0^5 g(x)$

$7 + 4 + 3 = 14$ not 10

False

9. $\int_0^6 (2x^2 - 9x + 4)\,dx = \frac{2x^3}{3} - \frac{9x^2}{2} + 4x \Big|_0^6$

$\frac{2(6)^3}{3} - \frac{9(6)^2}{2} + 4(6) - 0$

10. $\left| \int_0^2 x^2\,dx \right| + \left| \int_2^6 (6-x)\,dx \right|$

$\left| \frac{x^3}{3} \Big|_0^2 \right| + \left| 6x - \frac{x^2}{2} \Big|_2^6 \right|$

$\frac{8}{3} + |18 - 10|$

$\frac{8}{3} + \frac{8 \cdot 3}{3} = \boxed{\frac{32}{3}}$