Math 181 Final Review Version D

Name: Key **Recitation:** _____

This answer sheet is the only page you will turn in. Please remove it from the rest of the test and record your answers in the spaces provided.

1. For every $\varepsilon > 0$ there is $\delta > 0$ such that if $0 < |x-a| < \delta$ then $|f(x) - L| < \varepsilon$

2. $f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$

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

4. $\int_a^b f(x)\,dx = \lim_{n \to \infty} \sum_{k=0}^{n-1} f\left(a + k \cdot \frac{b-a}{n}\right) \cdot \frac{b-a}{n}$

5(i). 5

5(ii). 1

5(iii). 2

6(i). $\frac{3}{1+(3x)^2}$

6(ii). $\frac{-x^2+3}{(x^2+3)^2}$

6(iii). $-2\sin(2x+1)\,\frac{\cos(2x+1)}{|\cos(2x+1)|}$

7(i). $\frac{3}{4}x^4 - \frac{1}{3}x^3 + C$

7(ii). $-\frac{1}{7}\cos(x^7-1) + C$

7(iii). $\frac{2}{5}(x+2)^{5/2} - \frac{4}{3}(x+2)^{\frac{3}{2}}$

8(i). $\frac{15}{64}$

8(ii). 1

8(iii). $\ln 5 - \ln 2$

9(i). $92\ \text{cm}^2/\text{s}$

9(ii). $\frac{56}{9}\ \text{ft/s}$

9(iii). $\frac{7-\sqrt{19}}{6}$

10(i). (T) (F)

10(ii). (T) (F)

10(iii). (T) (F)

Math 181 Final Review Version B

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1. See version E

2. See version E

3. $y' = -\dfrac{\sin y + 3y\cos x}{x\cos y + 3\sin x}$

4. See version E

5(i). -5

5(ii). $3/2$

5(iii). -3

6(i). $\dfrac{-1}{1+x^2}$

6(ii). $\dfrac{9-x^2}{(9+x^2)^2}$

6(iii). $-\frac{3}{2}\cdot\dfrac{\sin(2-6x)}{|\sin(1-3x)|}$

7(i). $\frac{1}{2}x^4 - \frac{1}{3}x^3 + C$

7(ii). $\dfrac{\sin(x^5-2)}{5} + C$

7(iii). $\frac{2}{5}(x+3)^{5/2} - 2(x+3)^{3/2} + C$

8(i). $15/4$

8(ii). 1

8(iii). $\ln 4$

9(i). $100\ \text{cm}^2/\text{s}$

9(ii). $\frac{70}{9}\ \text{ft/s}$

9(iii). $\dfrac{8-\sqrt{13}}{6}$ in ≈ 0.60685 in

10(i). (T) (F)

10(ii). (T) (F)

10(iii). (T) (F)

Math 181 Final Review Version C

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1. See version E

2. See version E

3. $y' = -\dfrac{\sin y + 2y\cos x}{x\cos y + 2\sin x}$

4. See version E

5(i). -5

5(ii). $2/3$

5(iii). -2

6(i). $\dfrac{2}{1+4x^2}$

6(ii). $\dfrac{4-x^2}{(4+x^2)^2}$

6(iii). $-\dfrac{3}{2}, \dfrac{\sin(6x-2)}{|\cos(3x-1)|}$

7(i). $\frac{1}{2}x^4 + \frac{1}{3}x^3 + C$

7(ii). $\dfrac{-\cos(x^5+3)}{5} + C$

7(iii). $\frac{2}{5}(x-1)^{5/2} + \frac{2}{3}(x-1)^{3/2} + C$

8(i). $2/3$

8(ii). 1

8(iii). $\ln 5/4$

9(i). $85\ cm^2/s$

9(ii). $\frac{80}{11}$ [illegible] ft/s

9(iii). $\frac{8-\sqrt{19}}{6}$ inches ≈ 0.60685 in

10(i). (T) (F)

10(ii). (T) (F)

10(iii). (T) (F)

Math 181 Final Review Version E

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This answer sheet is the only page you will turn in. Please remove it from the rest of the test and record your answers in the spaces provided.

1. $\lim_{x\to a} f(x) = L$ means for every $\varepsilon > 0$ there is $\delta > 0$ such that if $0 < |x-a| < \delta$ then $|f(x) - L| < \varepsilon$.

2. $f'(x) = \lim_{h\to 0} \frac{f(x+h)-f(x)}{h}$

3. $y' = -\frac{y\cos x + 2\sin y}{2x\cos y + \sin x}$

4. $\int_a^b f(x)\,dx = \lim_{n\to\infty} \sum_{k=0}^{n-1} f\left(a + k\frac{b-a}{n}\right)\frac{b-a}{n}$

5(i). 5

5(ii). $1/3$

5(iii). 3

6(i). $\frac{-2}{1+4x^2}$

6(ii). $\frac{5-x^2}{(5+x^2)^2}$

6(iii). $\frac{\sin(4x-10)}{|\sin(2x-5)|}$

7(i). $\frac{3x^4}{4} + \frac{x^3}{3} + C$

7(ii). $\frac{\sin(x^7+1)}{7} + C$

7(iii). $\frac{2}{5}(x-2)^{5/2} + \frac{4}{3}(x-2)^{3/2} + C$

8(i). $3/8$

8(ii). 1

8(iii). $\ln 2$

9(i). $92\ \text{cm}^3/\text{s}$

9(ii). $6\ \text{ft/s}$

9(iii). $\frac{5-\sqrt{7}}{3}$ in $\approx .7843$ in

10(i). (T) (F)

10(ii). (T) (F)

10(iii). (T) (F)