MAC 2233 (Business Calculus) Name_____
Integrals Quiz (Fall 2019) Date: _____
Kincade Section: _____

You MUST show your work to receive full credit. This quiz is worth 30 points. Each problem is worth 2 points unless otherwise specified.

Find the integral.

1) $\int (\sqrt{x} + \sqrt[3]{x})\, dx$ 1) _____

A) $\frac{2}{3}x^{3/2} + \frac{3}{4}x^{4/3} + C$ B) $2\sqrt{x} + 3\sqrt[3]{x} + C$

C) $2\sqrt{x} + 2\sqrt[3]{x} + C$ D) $\frac{1}{2}x^{3/2} + \frac{2}{3}x^{4/3} + C$

2) $\int \frac{3\sqrt{x} - 5}{x^2}\, dx$ 2) _____

A) $-\frac{6}{\sqrt{x}} - \frac{5}{x} + C$ B) $\frac{6}{\sqrt{x}} - \frac{5}{x} + C$ C) $-\frac{6}{\sqrt{x}} + \frac{5}{x} + C$ D) $\frac{6}{\sqrt{x}} + \frac{5}{x} + C$

3) $\int (t^3 + e^{5t})\, dt$ 3) _____

4) $\int \left(\frac{1}{x} + \frac{2}{x^2} + \frac{3}{x^3} \right) dx$ 4) _____

A) $\ln|x| + 2\ln|x^2| + 3\ln|x^3| + C$

B) $\ln|x| - \frac{2}{x} - \frac{3}{2x^2} + C$

C) $\frac{2}{x^2} + \frac{6}{x^3} + \frac{12}{x^4} + C$

D) $2x + 2\ln|x^2| + 3\ln|x^3| + C$

5) $\int \frac{\sqrt{x} - 4}{2x\sqrt{x}} dx$ 5) _____

A) $\frac{1}{2}\ln|x| - 4x^{-1/2} + C$

B) $\frac{1}{2}\ln|x| + 4x^{-1/2} + C$

C) $\frac{1}{2}\sqrt{x}\ln|x| + 4x^{-1/2} + C$

D) $\frac{1}{2}\sqrt{x}\ln|x| - 4x^{-1/2} + C$

6) $\int 9z\sqrt{3z^2 - 7}\, dz$ 6) _____

A) $\frac{1}{2}z(3z^2 - 7)^{3/2} + C$

B) $(3z^2 - 7)^{3/2} + C$

C) $z(3z^2 - 7)^{3/2} + C$

D) $\frac{1}{2}(3z^2 - 7)^{3/2} + C$

7) $\int \frac{x}{(7x^2 + 3)^5}\, dx$ 7) _____

A) $\frac{-1}{14(7x^2 + 3)^6} + C$

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

C) $\frac{-7}{3(7x^2 + 3)^6} + C$

D) $\frac{-1}{56(7x^2 + 3)^4} + C$

8) $\int (1 - 6x)e^{3x-9x^2}\, dx$ 8) _____

A) $3e^{3x-9x^2} + C$

B) $3(1 - 6x)e^{3x-9x^2} + C$

C) $\frac{1}{3}e^{3x-9x^2} + C$

D) $\frac{1}{3}(1 - 6x)e^{3x-9x^2} + C$

9) $\int \frac{t^4 + 2}{t^5 + 10t + 9}\, dt$ 9) _____

10) $\int \frac{1}{x(\ln x^4)}\,dx$ 10) _____

A) $\frac{1}{4}\ln\left|\ln x^4\right| + C$ B) $\frac{1}{4}\ln x^4 + C$ C) $\ln x^4 + C$ D) $\ln\left|\ln x^4\right| + C$

Evaluate.

11) $\int_1^e \left(8x - \frac{13}{x}\right)dx$ 11) _____

12) $\int_1^3 \frac{x^5 - x^{-1}}{x^2}\,dx$ 12) _____

13) $\int_0^3 \sqrt{3x}\,dx$ 13) _____

Use integration by parts to find the integral.

14) $\int x\sqrt{7-x}\,dx$ 14) _____

A) $-\frac{2}{3}x(7-x)^{3/2}+\frac{4}{15}(7-x)^{5/2}+C$

B) $-\frac{2}{3}x(7-x)^{3/2}-\frac{4}{15}(7-x)^{5/2}+C$

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

D) $\frac{2}{3}x(7-x)^{3/2}+\frac{4}{15}(7-x)^{5/2}+C$

15) **Use the Double Substitution Method to integrate** 15) _____

$\int x\sqrt{8-x}\,dx$