LAB QUIZ 6

1.

Calculate the following integral: $\int \frac{3x^4 - 2x^3 + 2x^2 + 5}{x^3 - x^2} dx$

a. $\frac{3}{2}x + x^2 - 5\ln|x| - 2\ln|x-1| - \frac{5}{x} + C$

b. $3x^2 + x + 5\ln|x| + 8\ln|x-1| + \frac{5}{x} + C$

c. $\frac{3}{2}x^2 + x - 5\ln|x| + 8\ln|x-1| + \frac{5}{x} + C$

d. $\frac{3}{2}x^2 - 3\ln|x| + 8\ln|x-1| + \frac{5}{x} + C$

e. $\frac{3}{2}x + x^2 - 5\ln|x| + 2\ln|x-1| + \frac{5}{x} + C$

2.

$$\int \frac{4x^2 - 10x}{(x-5)(x-6)^2} dx$$

a) $-50\ln|x-5| + 23\ln|x-6| + \frac{42}{x-6} + C$

b) $84\ln|x-5| - 96\ln|x-6| - \frac{50}{x-6} + C$

c) $50\ln|x-5| - 46\ln|x-6| - \frac{84}{x-6} + C$

d) $50\ln|x-5| - 46\ln|x-6| + \frac{84}{x-6} + C$

e) $46\ln|x-5| - 50\ln|x-6| - \frac{84}{x-6} + C$

f) None of these

3.

[redacted] Let $f(x)$ be a positive function that is increasing and concave up over the interval [a,b]. Which of the following is/are true? (R: right end point approximation over this interval, L: left end point, T: trapezoidal, S:Simpson's.)

(i) $L_{10} < T_{10} < R_{10}$

(ii) $L_{10} < S_{10} < R_{10}$

(iii) $T_{10} < \int_a^b f(x)dx$

a) (i), (ii) and (iii)
b) (i) and (ii) only
c) (i) and (iii) only
d) (iii) only
e) (ii) and (iii) only
f) None of these

4.

Let $f(x)$ be a positive function that is increasing and concave down over the interval [a,b]. Which of the following is/are true? (R: right end point approximation over this interval, L: left end point, T: trapezoidal, S:Simpson's.)

(i) $R_{10} < T_{10} < L_{10}$

(ii) $R_{10} < S_{10} < L_{10}$

(iii) $T_{10} < \int_a^b f(x)dx$

a) (i), (ii) and (iii)
b) (i) and (ii) only
c) (i) and (iii) only
d) (iii) only
e) (ii) and (iii) only
f) None of these

5.

Suppose $f(x)$ is an decreasing, concave down function and you use numeric integration to compute the integral of f over the interval $[0, 1]$. Put the values of the errors for each approximation using $n = 100$ for the right end-point rule $\left(E_{100}^{R}\right)$, the trapezoid rule $\left(E_{100}^{T}\right)$, and Simpson's rule $\left(E_{100}^{S}\right)$ from the least to the greatest.

a) ○ $E_{100}^{S}, E_{100}^{T}, E_{100}^{R}$
b) ○ $E_{100}^{R}, E_{100}^{T}, E_{100}^{S}$
c) ○ $E_{100}^{R}, E_{100}^{S}, E_{100}^{T}$
d) ○ $E_{100}^{S}, E_{100}^{R}, E_{100}^{T}$
e) ○ $E_{100}^{T}, E_{100}^{S}, E_{100}^{R}$
f) ○ None of the above.