

You may keep this page of questions. Turn in your answers with all of your work on the pink paper and lime colored paper. Problems # 1 – 6 are worth 8 points each. Problems # 7 and 8 are worth 12 points each. Problems # 9 and 10 are worth 14 points each. You are **NOT** allowed to use calculators or Mathcad on questions #1 – 9. Work these questions on the pink paper. After you have finished these first nine questions, turn in the first part of the exam and receive a page of lime colored paper to use for the numerical integration question.

(1) Evaluate $\int (3x + 5)^{10} dx$.

(2) Find $f'(x)$ if $f(x) = \sinh(\tan x)$.

(3) Find $\frac{dy}{dt}$ if $y = \tanh^{-1}(t^5)$.

(4) Evaluate $\int_0^{10} \frac{x + 2}{x^2 + 4x + 10} dx$.

(5) Evaluate $\int_2^6 \frac{dx}{\sqrt{x^2 + 4}}$

(6) Evaluate $\int x\sqrt{3x - 5} dx$

(7) Find Maclaurin series for the function $f(x) = e^{-3x}$. Express the final answer using summation notation.

(8) A particle moves along a straight line with velocity $v = \frac{6}{\sqrt{3t + 1}}$ at time t . Find its position s as a function of time if it has initial position $s_0 = 2$.

(9) Find the logarithmic form for $\tanh^{-1} x$. Show your work!

(10) Use Mathcad or your calculator to find the Simpson's rule approximation S_6 for $\int_1^4 \sqrt{x^3 + 3x} dx$. Show your work!! Calculate values for the y_i and for S_6 to at least six significant digits.