New York City College of Technology

MAT 1475 - Fall 2019

Review for Exam 2

NAME: _____

Instructions: The exam will cover Sections 2.3, 2.4, 2.5, 2.6, 2.7.
The exam questions are closely related to the homework and to the examples shown in class. Make sure you review your WeBWorK assignments.
For more practice you are strongly encouraged to do the suggested homework from the textbook.
Make sure you know the Glossary of Derivatives of Elementary Functions (Theorem 24, page 121). It is an excellent review of all basic formulas and rules.

OpenLab: Please register for the OpenLab if you don't have an OpenLab account yet: https://openlab.citytech.cuny.edu/
This is a very quick process once you know how to access your City Tech email.
Once you are registered please visit our class site and click "join" (below the picture):
https://openlab.citytech.cuny.edu/groups/mat1475-calculus-i-fall-2019/
(you need to login to OpenLab to be able to join).
Solutions to this review sheet and other important documents will be posted on this site.

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1. Find the derivatives of the following functions

   (a) $f(x) = 5x^9$.
   (b) $f(x) = 6^x$.
   (c) $f(x) = e^6$.
   (d) $f(x) = \cot(x)$.
   (e) $f(x) = \cos^{-1}(x)$.
   (f) $f(x) = \sin(5x)$.
   (g) $f(x) = 3 + \cos(x) + \cos(3)$.
   (h) $f(x) = \sqrt[3]{x^2}$.
   (i) $f(x) = x + 11$.
   (j) $f(x) = \dfrac{1}{x^8}$.
   (k) $f(x) = x^x$.
   (l) $f(x) = (12x^3 - 2x^5)^4$.
   (m) $f(x) = \cos(x^4)$.
   (n) $f(x) = \cos^4(x)$.
   (o) $f(x) = x^4 + 4^x + \sin(4) + \dfrac{1}{\sqrt{x}} + \dfrac{1}{x^4}$.
   (p) $f(x) = \sin(x^2 + 5)e^{\cos x}$.
   (q) $f(x) = \dfrac{5x^2}{\sin x}$.
   (r) $f(x) = e^{x \sin x}$.
   (s) $f(x) = \dfrac{x}{5}$.

(t) $f(x) = \dfrac{x^2 - 4}{x^2 - 5}$. (Simplify your answer.)

(u) $f(x) = e^{-7x} \tan(3x)$.

(v) $f(x) = \tan^{-1}(5x)$.

(w) $f(x) = \ln(3x^2 + 7x + 5)$.

(x) $f(x) = \sec(x)$.

2. Calculate the derivative of y with respect to x given that $xe^y = 5xy + 4y^4$.

3. Find the equation of the tangent line to $x^2 + xy + y^2 = 3$ at (1,1).

4. Find the equation of the line that is tangent to the curve $y = 5x \cos x$ at the point $(\pi, -5\pi)$.