CALCULUS II

FIRST PARTIAL

QUIZ 1A

95/11

Name: Laura M. Londoño Hidalgo **ID#:** A01570224 **Date:** 17 / 01 / 2018

Answer the following problems with complete procedure.

1. Find the **approximate** value of $(3.04)^3$ (20 pts)

$x_1 = 3$

$y = x^3$

$y' = 3x^2$

$\Delta y = F'(x)[dx] + F(x)$

$dy = [3(3)^2][3.04 - 3] + (3)^3$

$dy = [27][.04] + 28.095$

$\Delta y \cong 29.174$

2. Given the equation $f(x) = x^2 - 2x + 3$ find the line tangent to the curve at $x = a = 0$. (20 pts)

$x = 0$

$F'(x) = 2x - 2$ $x_1 = 0$

SLOPE

$F'(0) = 2(0) - 2$

$m = -2$

"y" VALUE

$F(0) = (0)^2 - 2(0) + 3$

$y = 3$

$y - y_1 = m(x - x_1)$

$y - 3 = -2(x - 0)$

$y - 3 = -2x$

$y = -2x + 3$

$y = mx + b$

$y - y_1 = m(x - x_1)$

3. The edge of a cube was found to be 20 cm. with a possible error in measurement of 0.1cm. Estimate the maximum possible error in computing the volume of the cube (20 pts)

Δx DIFFERENTIAL

VOLUME OF A CUBE

$V = x^3$ $x = 20$ $\Delta = 0.1$

$\frac{dV}{dt} = x^3$

$\frac{dV}{dt} = 3x^2$

$dV = 3x^2[dt]$

$dV = 3(20)^2[0.1]$

$dV \cong 120\ cm^3$

$V = x^3 \longrightarrow x = 20$

$V' = 3x^2$ $\Delta x = 0.1$

D: $F'(x)[\Delta x]$

$3x^2[\Delta x]$

$3(20)^2[0.1]$

4. A can is going to be modified in such a way that its height will change from 14cms to 14.8 cm but the diameter of the base will remain as 9cm.

a) Find the change in the volume of the can (20 pts)

VOLUME OF A CAN

$V = \pi r^2 h$

Diameter: 9

Radius 4.5

$x_1 = 14$

$x_2 = 14.8$

$\Delta V = y_2 - y_1$

$y_1(14) = \pi(4.5)^2(14)$

$y_1 = 890.641$

$y_2(14.8) = \pi(4.5)^2(14.8)$

$y_2 = 941.535$

$\Delta V = 941.535 - 890.641$

$\Delta V = 50.8943\ cm^3$

b) Find the approximate change in the volume of the can (20 pts)

VOLUME OF A CAN

$V = \pi r^2 h$

Radius: 4.5

$x_1 = 14$

$x_2 = 14.8$

$\frac{dV}{dt} = \pi r^2 h$

$\frac{dV}{dt} = \pi r^2$

$dV = \pi r^2 [dt]$

$dV = \pi(4.5)^2[14.8 - 14]$

$dV = \pi(4.5)^2[.8]$

$dV = 50.8938\ cm^3$

QUIZ 1: FIRST PARTIAL CORRECTIONS.

1. Find the approximate value of $(3.01)^3$.

$X_1 = 3 \quad X_2 = 3.04$

$y = X^3$

$y' = 3X^2$

$y = F'(X)[\Delta x] + F(X)$

$y = [3(3)^2][3.04 - 3] + (3)^3$

$y = [27][.04] + 27$

$y = 1.08 + 27$

$\boxed{y \approx 28.08}$