

Math 141
No Work-No Credit

Exam 4

Su 00

Name
SS#

***Work either problem 2 or 4, but not both!!!

- 1) Use Newton's Method to approximate the nearest root of $f(x) = x - 6 \ln x$
Using $x_1 = 13$ as the initial guess. List each approximation until the approximation is repeated to 7 decimal places.

$X_2 =$

$X_3 =$

$X_4 =$

$X_5 =$

$X_6 =$

- 2) A metal cylinder is shrinking while cooling, with the radius decreasing 0.001 Inches/min and the height decreasing 0.01 inches/min. At the instant when the height is 100 inches and the radius is 5 inches, find the rate of change in the volume of the cylinder. ($V = \pi r^2 h$)

3) For $f(x) = xe^x$, determine:

a) critical numbers

b) relative maximum:

relative minimum:

c) intervals where $f(x)$ is:

increasing:

decreasing:

d) intervals where $f(x)$ is:

concave up:

concave up:

- 4) A rectangular printed page is to have margins 2 inches wide at the top and the bottom and margins 1 inch wide on each of the two sides. If the page is to have 35 square inches of printing, determine the minimum possible area of the page itself.

5) Evaluate: $\lim_{x \rightarrow 0} (x + e^{2x})^{-2/x}$

6) Convert $(-1, 1)$ to polar coordinates.

7) For $r = \sin \theta$, determine $\frac{dy}{dx}$.