Math 101-161 Major Quiz 5

Name: **ID:** **Sec:** **Sr:**

Question 1:

If $y = \sqrt{x}(x-3)$, then y is

(a) decreasing on $(0,1)$ and increasing on $(1,+\infty)$.

(b) increasing on $(0,1)$ and decreasing on $(1,+\infty)$.

(c) increasing on $(0,1)$ and increasing on $(1,+\infty)$.

(d) decreasing on $(0,1)$ and decreasing on $(1,+\infty)$.

(e) increasing on $(0,+\infty)$.

Question 2:

If $f(x) = 4 + \sqrt{x-1}$, then the value of c guaranteed by the mean value theorem on $[1, 5]$ is

(a) 2

(b) 1

(c) 0

(d) 6

(e) 4

Question 3:

$$\lim_{x \to 0} \left[\frac{1}{x(x+1)} - \frac{\ln(1+x)}{x^2} \right] =$$

(a) $-\frac{1}{2}$

(b) 0

(c) 1

(d) ∞

(e) $\frac{1}{2}$

Question 4:

The height of a right circular cone is $4cm$ and its radius is $2cm$. The dimensions of the right circular cylinder with the maximum volume that can be inscribed in the cone is:

(a) $\text{radius} = \frac{4}{3}\,\text{height} = \frac{4}{3}$

(b) $\text{radius} = \frac{2}{3}\,\text{height} = \frac{2}{3}$

(c) $\text{radius} = \frac{2}{3}\,\text{height} = \frac{4}{3}$

(d) $\text{radius} = \frac{4}{9}\,\text{height} = \frac{4}{9}$

(e) $\text{radius} = \frac{4}{3}\,\text{height} = \frac{4}{9}$

Question 5:

If we use Newton's method to find an approximate solution for $x - 2\cos x = 0$ starting with $x_1 = \frac{\pi}{2}$, then the next approximate solution is $x_2 =$

(a) $\frac{\pi}{3}$

(b) 0

(c) π

(d) $\frac{\pi}{4}$

(e) $\frac{\pi}{6}$

Question 6:

If $f'(x) = \dfrac{(1+3\sqrt{x})^2}{x}$ then the most general antiderivative is

(a) $\ln|x| + 12\sqrt{x} + 9x + C$

(b) $\ln|x| + 12\sqrt{x} + 9x^2 + C$

(c) $\ln|x| + 6\sqrt{x} + 9x + C$

(d) $\ln|x| + 3\sqrt{x} + 9x + C$

(e) $\ln|x| + 6\sqrt{x} + 9x^2 + C$