Math 220 (section AD) **Quiz 10** **Fall 2019**

Name _____

- You have 20 minutes
- No calculators
- Show sufficient work

1. (2 points) Fill in the missing information for the following two theorems.

Mean Value Theorem Let f be a function that satisfies the following two hypotheses.

(1) f is _____ on the closed interval $[a, b]$.

(2) f is _____ on the open interval (a, b).

Then there is a number c in (a, b) such that _____ .

Rolle's Theorem Let f be a function that satisfies the following three hypotheses.

(1) f is _____ on the closed interval $[a, b]$.

(2) f is _____ on the open interval (a, b).

(3) _____ .

Then there is a number c in (a, b) such that _____ .

2. (2 points) Evaluate the definite integral. Simplify your answer.

$$\int_1^{e^2} \frac{24}{x\sqrt{9+8\ln(x)}}\,dx$$

3. (2 points) Evaluate the indefinite integral.

$$\int \frac{10e^{2x}\cos\left(e^{2x}\right)}{\sin^2\left(e^{2x}\right)+1}\,dx$$

4. (2 points) Evaluate the indefinite integral.

$$\int \frac{4x^{11}}{(x^4+2)^3}\,dx$$

5. (2 points) Let **R** be the finite region bounded by the given functions. In the following way, set up but do not evaluate definite integrals which represent the area of the region **R**.

$y = 10\sqrt{x}$

$y = 5x$

(a) Integrate with respect to x.

(b) Integrate with respect to y. (The integrands in parts (a) and (b) should be different.)