Math 2471 – Spring 2010 Name_____

Review for Test 3

For full credit: use calculus to solve problems, circle answers, and **show all your work**.

1) Use the limit process to find the area under the curve of $y = x^2 + 2$ on [2, 5].

2) I evaluated the integral $\int_{-2}^{2}(x^3)dx =$ and found the result to be zero. I double checked my work and found no errors; however, I know there is some area between the graph and the *x*-axis. Please explain the result.

3) Evaluate the integral:

$\int_{2}^{5}(-3v + 4)dv =$

4) Determine the area under the curve $y = (3 - x)\sqrt{x}$ between $x = 4$ and $x = 9$.

5) Evaluate the integral without using calculus or your calculator:

$\int_{0}^{4}3xdx =$

6) Find the indefinite integral and check the result by differentiation of $\int(t^2 - \sin t)dt$.

7) Evaluate the integral: $\int_{0}^{1}(x - x^2)dx =$.

8) Evaluate the integral: $\int_{-1}^{1}(t^3 - 9t)dt =$

9) Find the indefinite integral:

$\int 5x * \sqrt[3]{1 - x^2}\,dx =$

10) Evaluate the integral: $\int_{0}^{\pi}(1 + \sin x)dx =$.

11) Find the equation of a line tangent to: $y = \ln x^3$ at the point (1,0).

12) Find the derivative of: $y = \ln(x\sqrt{x^2 - 1})$.

13) If $g(x) = (\ln x)^4$ then find $g'(x) =$

14) Find: $\int \frac{x}{x^2 + 1} dx =$

15) Find the derivative of: $y = \ln|\sin x|$.

16) Evaluate: $\int_0^4 \frac{5}{3x + 1} dx =$

17) Use logarithmic differentiation to find the derivative of: $y = x^{x-1}$

18) Find the integral: $\int 5^{-x} dx =$

19) Solve the equation for x: $\arcsin\sqrt{2x} = \arccos\sqrt{x}$.

20) Solve the differential equation: $\frac{dy}{dx} = x + 2$

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22) Find the **area** between $f(x) = (x-1)^3$ and $g(x) = x - 1$ on [0 , 2].

23) Solve the differential equation:
$y' = \frac{5x}{y}$

24) Find the derivative of $y = \ln|x|$.

25) Find the integral: $\int 5e^{5x}\,dx =$

26) If $f(x) = \sqrt{x-4}$ then find $f^{-1}(x) =$

27) Solve for x: $e^{\ln x} = 4$

28) Use logarithmic differentiation to find the derivative of: $y = x^{2/x}$

29) Find the derivative of:
$f(x) = 2\arcsin(x-1)$

30) Evaluate the integral:
$\int_0^{1/6} \frac{3}{\sqrt{1-9x^2}}\,dx$