180 possible points; 30 for each problem 1 - 6.   Name _____

The general directions are on a separate sheet. Read them first.

****

You may not use a calculator with a built in symbolic integration function on problems 1 and 2. Do them below the line and on the paper I've provided. When you've finished with these problems, ask me for the rest of the test.

[30 possible: 5 pts each for a - d; 10 pts for e]

1. Find these. Rewrite the given integral and show your work, using correct notation. <u>Simplify all results</u>. You <u>must</u> use Integration by Substitution("Let u = ...") <u>on Problem (e)</u> so I can tell you know how to do it. If you can't do it for (e), do it for (d) instead for less credit.

(a) $\int \left(\sqrt{x} + \frac{1}{x^{1/3}} + 2 \cdot \sin x \right) dx$;

(b) $\int \left(\frac{x}{w} - yw^2 \right) dw$;

(c) $\int_0^1 x \cdot e^{-2x^2} dx$

(d) $\int e^x \sqrt{e^x + 2}\ dx$

(e) $\int \frac{\cos \sqrt{x}}{\sqrt{x}}\ dx$

_____

[30 possible]

2. Evaluate the following definite integral using <u>Integration by Substitution</u>. To do so, let u = 26 – x². Use the method that involves changing the limits of integration. Show all your steps logically using correct notation. **After you've found the value, describe at least one way that you could use to determine whether the numerical value you got for the definite integral is close or not. Then do it.** The integral to evaluate is

$\int_1^5 \frac{x}{\sqrt{26 - x^2}}\ dx.$ [Note: If you can't do this one, you may do the problem for this integral: $\int_0^1 2x(1 + x^2)^4 dx.$

In this case, let u = 1 + x². You also have to do the bolded question for this integral as well. This alternative problem would be for less credit.]

_____