Term Test C Material Covered

The topic for term test C is integration. You need to be able to evaluate definite and indefinite integrals, find areas, volumes, arc lengths, and surface areas. You need to be able to solve word problems involving rate of change. Material covered in lesson 14, integration methods, is (a) substitution and (b) integral tables. Integration by parts will not be on the term test.

You only need a basic calculator with trigonometric functions for this term test. Information from integral tables will be provided in the test instructions.

Term Test C Practice Questions

Test Example 1. Find the area enclosed by the curves

$$x = y^2 - y \text{ and } x = y - y^2$$

Test Example 2. S is a solid generated by revolving a bounded region R about the x-axis. Find the volume of S. R is bounded by $x + y = 5$ and $xy = 4$.

Test Example 3. Find the length of the following arc,

$$x = \frac{1}{3}(y-3)\sqrt{y}, 0 \leq y \leq 3$$

Test Example 4. Find the area of the lateral surface S obtained by revolving the given arc C around the x-axis.

$$C = \{(x, y) : 0 \leq x \leq 2, y^2 = 2 - x\}$$

Note that

$$\int \sqrt{ax+b}\, dx = \frac{2}{3a} \cdot (ax+b)^{\frac{3}{2}} + C \tag{1}$$

Test Example 5. Find the indefinite integral

$$\int \frac{e^{-2x}}{\sqrt{1-e^{-4x}}}\, dx$$

Note that

$$\int \frac{1}{\sqrt{1-x^2}}\, dx = \arcsin x + C \tag{2}$$

Test Example 6. Find the following indefinite integrals. Remember that the derivative of $f(x) = \tan x$ is $f'(x) = \sec^2 x$.

$$\int \frac{3x-2}{4x+7}\,dx$$

$$\int e^{\tan x}\sec^2 x\,dx$$

Test Example 7. [This type of problem will not be on term test C] Evaluate

$$\int_0^{\frac{\pi}{4}} \sin^2 2x\cos^2 2x\,dx$$

$$\int_0^{\frac{\pi}{4}} \cos^2 3x\sin^3 3x\,dx$$

Test Example 8. [This type of problem will not be on term test C] Use integration by parts to integrate

$$\int x^3 e^{2x}\,dx$$

$$\int_0^{\frac{\pi}{4}} e^{3x}\sin 4x\,dx$$