
DIRECTIONS To receive full credit, you must provide complete legible solutions to the following problems in the space provided. Transfer all your answers to the space provided on the test paper.

1. Use an appropriate triangle to convert the given integral into a trigonometric integral then simplify the integrand.

a. $\int \frac{x^2}{\sqrt{x^2 + 4}} dx$ Ans _____

b. $\int x^3 \sqrt{9 - x^2} dx$ Ans _____

c. $\int \frac{\sqrt{x^2 - 4}}{x^2} dx$ Ans _____

2. Evaluate the integral. Ans _____
 $\int x^3 \sqrt{9 - x^2} dx$

3. Evaluate the integral

$$\int \frac{t^5}{\sqrt{t^2 + 2}} dt$$

Ans _____

4. Evaluate the integral

$$\int \frac{x^2 dx}{(x^2 + 2x + 2)^{3/2}}$$

Ans _____

5. A water storage tank has the shape of a cylinder with diameter 22 ft. It is mounted so that the circular cross-sections are vertical. If the depth of the water is 18 ft, what percentage of the total capacity is being used?