

Calculus II (Math 232) Exam 1

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Justify answers and show all work for full credit.

NAME: _____

1. Given $0 < H < R$, find the volume of liquid needed to fill a sphere with radius R to height H .
2. Find the volume of the solid whose base is the triangle enclosed by $x + y = 3$ and the x & y axes; and cross-sections perpendicular to the y -axis are semicircles.
3. Use the shell method to find the volume of the solid generated by revolving about the x -axis the region bounded by $y = \ln x$, $y = 0$, and $x = 2$.
4. Find the volume of the solid by rotating the region bounded by $y = 2 - x^2$ and $y = x$ about the line $x = 1$. Set up the integral, but do not integrate.
5. Find the volume of the solid by rotating the region bounded by $y = 2 - x^2$ and $y = x$ about the line $y = -2$. Set up the integral, but do not integrate.

Evaluate the following integrals. Make sure your final answers are only in terms of x . Show all work for full credit!

6. $\int_0^2 x^2 e^{3x} dx$

7. $\int \sin^2(12x) dx$

8. $\int \cos^3(6x) \sin^8(6x) dx$

9. $\int \sqrt{9 - 5x^2} dx$

10. $\int \frac{1}{x\sqrt{x^2 - 16}} dx$

11. $\int \frac{x^2 - 21x + 50}{(x - 2)(x^2 - 4)} dx$

12. $\int \frac{4x^4 + 100x^2 + 7}{x^2 + 25} dx$

13. $\int_0^2 x\sqrt{5 - \sqrt{4 - x^2}} dx$