Calculus II. Review 1.
Also study quizzes, homework, and examples from notes!
No calculators will be used for taking the test.
For each integration problem, you must show the set-up and all the steps.

1. Find the area between the curves $y = x^2 - 2x$, $y = x + 4$, and $x = 0$.

2. Find the area between $y = x^3$, $y = e^x$, $x = -1$, $x = 0$.

3. Find the area between $y = x - 1$ and $y^2 = 2x + 6$.

4. (skipped)

5. Just set up the integral for the area between $y = \cos x$ and $y = \sin 2x$ for $0 \leq x \leq \pi/3$.

6. Find the volume of the region inside $x = 0$, $y = 3x + 1$, $x = 2$, $x = y^2$ rotated around the x-axis.

7. Find the volume of the region inside $x = 0$, $x = 1$, $y = 2x$, $y = e^{x^2}$ rotated around the y-axis.

8. Just set up the integral for the volume of the region inside $x = 0$, $x = 1$, $y = 2x$, $y = e^{x^2}$ rotated around the x-axis.

9. Find the volume of the region inside $y = x^3$, $y = 0$, $x = 1$ rotated around the line $x = 2$.

10. Just set up the integral for the volume of the region bounded by:
$y = 0$, $y = 1$, $y = x$, $y = \sqrt{\ln(x)}$; rotated around the $y-$axis.

11. Find the average value of the function $f(x) = \dfrac{x + 7}{\sqrt{x}}$ on the interval $[0, 3]$.

12. Evaluate the definite integral. $\displaystyle\int_1^2 x^3 \ln(x)dx$

13. Find the indefinite integral. $\displaystyle\int e^x \sin(2x)dx$

14. Find the indefinite integral. $\displaystyle\int \sin^7 x \cos^6 xdx$

15. Find the indefinite integral. $\displaystyle\int \sin^8 x \cos^5 xdx$

16. Find the indefinite integral. $\displaystyle\int x^2 e^x dx$

17. Find the indefinite integral. $\displaystyle\int \sqrt{16 - x^2}dx$

18. Find the indefinite integral. $\displaystyle\int \dfrac{1}{x^2\sqrt{x^2 - 16}}dx$