MATH 150 Review Exam 6

1. Evaluate the integral by interpreting it in terms of areas.
   (a) $\int_{-1}^{4} 4 - 2x \ dx$
   (b) $\int_{-2}^{2} \sqrt{4 - x^2} \ dx$
   (c) $\int_{-1}^{2} | \ x \ | \ dx$
2. Evaluate the integral USING THE DEFINITION.
   (a) $\int_{1}^{4} x^2 + 2x - 5 \ dx$
   (b) $\int_{0}^{5} 1 + 2x^3 \ dx$
3. $\int_{0}^{1} (1 - x^9) \, dx$
4. $\int_{0}^{1} (\sqrt[4]{u} + 1)^2 \, du$
5. $\int_{0}^{1} 3 + x\sqrt{x} \ dx$
6. $\int_{1}^{4} \frac{1}{\sqrt{x}} \ dx$
7. $\int sec^2 \ t \ dt$
8. $\int_{-5}^{5} \frac{2}{x^3} \ dx$
9. $\int_{1}^{2} \frac{4 + u^2}{u^3} \ du$
10. $\int \frac{x}{\sqrt{1 - 4x^2}} \ dx$
11. $\int x^2\sqrt{2 + x} \ dx$
12. $\int \frac{4}{x(ln \ x)^2} \ dx$
13. $\int_{0}^{1} \sqrt[3]{1 + 7x} \ dx$
14. $\int x(2x + 5)^8 \ dx$

15. $\int e^x \sqrt{1+e^x}\ dx$

16. $\int \frac{e^{\sqrt{t}+1}}{\sqrt{t}}\ dt$

17. $\int 2^{3-4t}\ dt$

18. $\int_0^1 (1-x)^9\, dx$

19. $\int_0^1 y(y^2+1)^5\, dy$

20. $\int_1^2 \frac{1}{2-3x}\, dx$

21. $\int \frac{x+2}{\sqrt{x^2+4x}}\, dx$

22. Find the area of the region bounded by the given curves:

    (a) $y = x^2 - x - 6, \quad y = 0$

    (b) $y = 20 - x^2, \quad y = x^2 - 12$

    (c) $x + y = 0, \quad x = y^2 + 3y$