1. Evaluate
\[
\int_{-1}^{2} \frac{1}{2x+5} \, dx
\]
2. Assume that \( g \) is an even function and \( \int_{0}^{3} g(x) \, dx = 4 \). Find the average value of \( g \) on \([-3, 3]\)
3. Are the following functions even, odd or neither?
   (a) \( f(x) = x^{100} \)
   (b) \( g(x) = x^3 \)
   (c) \( h(x) = \cos(x) \)
   (d) \( k(x) = \sin(x) \)
4. You’re stopped at a red light just as the light turns green. You accelerate at a constant rate and after 10 seconds reach a velocity of 50 feet per second. You then stop accelerating a cruise at 50 feet per second for the next 50 seconds. How far did you travel during this minute?
5. Set up the integral that finds the area between the curves \( f(x) = -x^2 + 5x - 1 \) and \( g(x) = x^2 - 5x + 7 \).
6. The following is the graph of \( f(x) \).

Let \( F(x) \) be a function for which \( F'(x) = f(x) \). Which of the following could possibly be the graph of \( F(x) \)?
7. Evaluate \[ \int \frac{2x}{4 + x^2} \, dx. \]

8. Evaluate \[ \int \frac{1}{4 + x^2} \, dx. \]

9. Evaluate \[ \int_0^2 te^{5t} \, dt. \]

10. Evaluate \[ \int q^5 \ln |5q| \, dq. \]

11. Evaluate \[ \int_1^\infty \frac{\ln |x|}{x} \, dx. \]

12. Evaluate \[ \int_1^2 x \cos(-3x) \, dx. \]

13. Does the following integral converge or diverge?
   \[ \int_1^\infty \frac{(x^2 + 7x)(x - 1)}{x^4 - 2x^2 - 3} \, dx. \]

14. Evaluate \[ \int \frac{3x - 3}{x^2 - 1} \, dx. \]

15. Solve \[ \frac{dy}{dx} = 4x - 6e^{3x}, \quad y(0) = 4. \]

16. Solve \[ \frac{dy}{dx} = (y - 2)x^2, \quad y(0) = 4. \]

Cont.
17. Graph the polar functions $r = 1$ (a circle) and $r = 1 + \cos(\theta)$ (a cardioid). Set up the integral for the area outside of the circle but inside the cardioid.

18. Does $y = x^{3/2}$ satisfy the differential equation

$$\left(y''\right) \cdot \left(y'\right) = \frac{9}{4}?$$

19. Evaluate

$$\frac{d}{dx} \int_{-2}^{x} te^{t^2} \, dt.$$ 

20. Evaluate

$$\frac{d}{dx} \int_{-2}^{\cos(x)} te^{t^2} \, dt.$$ 

21. What is the volume when the region bounded by $y = -x^2 - 2x$ and $y = 0$ is revolved around the following axes

   (a) $y = 0$ (Just set up the integral.)
   (b) $y = -2$
   (c) $y = 2$ (Just set up the integral.)