1. Evaluate $\int \left(2x^3 - 4x^2 + \frac{4}{x^2} + \frac{1}{x}\right) dx$

2. Evaluate $\int \frac{x^2 - x + \sqrt{x}}{\sqrt[3]{x}} dx$

3. Evaluate $\int (\sin 2x + \cos 3x)\, dx$

4. Evaluate $\int \left(\sec^2 \theta + \sec\theta \tan\theta\right) d\theta$

5. Evaluate $\int \left(e^{2x} + e^{-3x}\right) dx$

6. Evaluate $\int \frac{1}{16 + x^2} dx$

7. Evaluate $\int \frac{3}{\sqrt{1 - 4x^2}} dx$

8. Evaluate $\int 12xe^{-3x^2} dx$

9. Evaluate $\int \sin x \sqrt{1 - \cos x}\, dx$

10. Evaluate $\int \frac{2x}{x^2 + 4} dx$

11. Evaluate $\int \frac{3}{\sqrt{x^2 - 1}} dx$

12. Evaluate $\int \frac{\left(\sqrt{x} + 1\right)^4}{2\sqrt{x}} dx$

13. Evaluate $\int \sin^{10} x \cos x\, dx$

14. Evaluate $\int x^2 \sec^2\left(x^3\right) dx$

15. Evaluate $\int \frac{1}{2x + 5} dx$

16. Evaluate $\int_0^{\sqrt{3}} x\sqrt{x^2 + 1}\, dx$

17. Evaluate $\int_{-2}^{2} e^{4x+8} dx$

18. Evaluate $\int_0^{3/4} \cos(\pi x)\, dx$

19. Evaluate $\int \frac{1}{x \ln x} dx$

20. Evaluate $\int \frac{(\arctan x)^5}{1 + x^2} dx$

21. Combine to write as a single integral $\int_0^8 f(x)\, dx + \int_{-2}^{0} f(x)\, dx + \int_8^6 f(x)\, dx$.

22. Suppose that h is function such that $h(1)=-2,\ h'(1)=2,\ h''(1)=3,\ h(2)=6,\ h'(2)=5,$ $h''(2)=13,$ and h" is continuous everywhere. Evaluate $\int_1^2 h''(x)dx$

23. If $F(x)=\int_{4x^2}^{9}\frac{1}{t}dt$, find $F'(x)$.

24. Evaluate

a. $\frac{d}{dx}\int_0^x e^{\arctan t}dt$ b. $\frac{d}{dx}\int_0^1 e^{\arctan x}dx$ c. $\int_0^1 \frac{d}{dx}\left(e^{\arctan x}\right)dx$

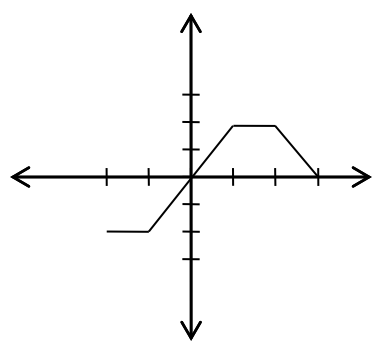
25. Estimate $\int_1^3 \left(x^2+2\right)dx$ by using a Riemann sum with $n=4$ and the right end points.

26. Find the average value of the function $f(x)=\frac{x}{\sqrt{x^2+1}}$ over the interval $[0,3]$.

27. Evaluate $\int_{-1}^{4}\left|x^2-9\right|dx$

28. If f is continuous and $\int_0^4 f(x)dx=10$, find $\int_0^2 f(2x)dx$.

29. The graph of f is shown below. Use it to evaluate $\int_{-2}^{3} f(x)dx$



30. Find the area between $f(x)=x^2$, $g(x)=x+2$ for $x=-2$ to $x=2$.

31. Find the area between the curve $f(x)=x^2+3x-4$ and x-axis between $x=-1$ and $x=4$.

32. Find the area bounded by the curves $y=2-\sqrt{x},\ y=\sqrt{x},$ and $x=0$.

Note the questions above are simply a sample of questions for the exam; it is possible that other types of questions may appear on your exam.