

Name \_\_\_\_\_ Per. \_\_\_ Date \_\_\_\_\_ Score: \_\_\_\_\_

**HW74: Unit 10 (Integrals) Test Review**

1.  $\int \frac{4}{\sqrt{t}} dt$

2.  $\int (u^3 - 2u + 7) du$

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

4.  $\int (x-8)^{23} dx$

5.  $\int \frac{x}{(4x^2+1)^3} dx$

6.  $\int \frac{y}{\sqrt{y+1}} dy$

7.  $\int_{-1}^1 x^4 dx$

8.  $\int_{-3}^0 (x^2 - 4x + 7) dx$

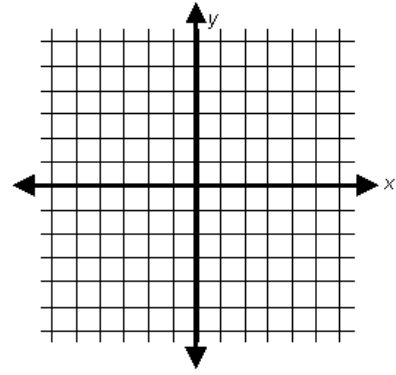
9.  $\int_0^2 2x(x^2+1)^3 dx$

10.  $\int_{-1}^1 \frac{x^2}{\sqrt{x^3+9}} dx$

11.  $\int_2^1 (4-3x)^8 dx$

12.  $\int_{-1}^2 |x| dx$

13. Evaluate  $\int_0^6 f(x)dx$ , if  $f(x) = \begin{cases} x^2, & x \leq 2 \\ 3x-2, & x \geq 2 \end{cases}$

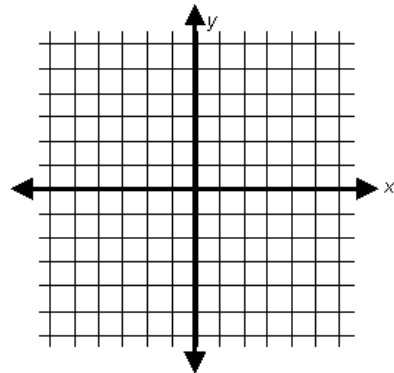


14. Find  $\int_0^6 3x dx$  using Riemann Sums with  $n = 2$  from the right.

15. Find  $\int_1^9 x^2 dx$  using Riemann Sums with  $n = 4$  from the left.

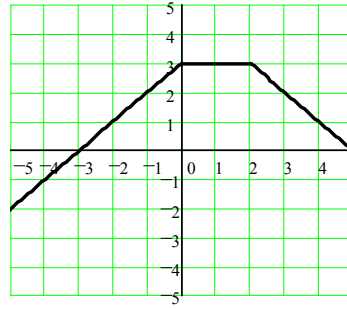
16. Find  $f(x)$  if  $f''(x) = 2 + \cos x$ ,  $f(0) = -1$ ,  $f(\pi/2) = 0$

17. Find the total area that is between the curve  $y = 4 - x^2$  and the interval  $[-2, 2]$ .



18. If  $\int_1^7 f(x)dx = 12$  and  $\int_7^3 f(x)dx = 10$  find  $\int_1^3 f(x)dx$

19. If  $f(x)$  has the graph to the right, find  $\int_{-5}^5 f(x) dx$



20.  $\int \frac{6}{\sqrt[3]{t}} dt$

21.  $\int (u^{-3} - 2u^{-2} + 5) du$

22.  $\int \frac{1 + \ln x}{x} dx$

23.  $\int (x-2)^{-15} dx$

24.  $\int \frac{6x}{(3x^2+1)^5} dx$

25.  $\int \frac{y}{\sqrt{y^2+1}} dy$

26.  $\int_0^1 xe^{x^2} dx$

27.  $\int_0^{\frac{\pi}{2}} \frac{\cos x}{\sin x + 2} dx$

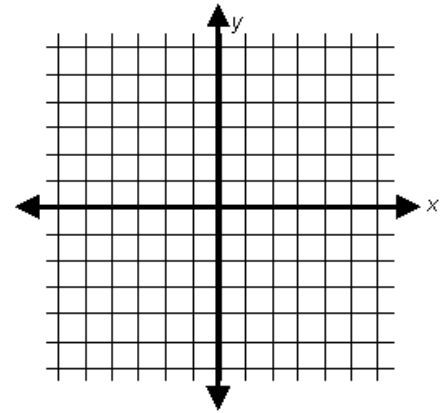
28.  $\int_0^1 3x^2(x^3+1)^3 dx$

29.  $\int_1^{\frac{1}{\sqrt{x^3+7}}} \frac{x^2}{\sqrt{x^3+7}} dx$

30.  $\int_2^0 (3x-1)^2 dx$

31.  $\int_{-3}^1 |x+2| dx$

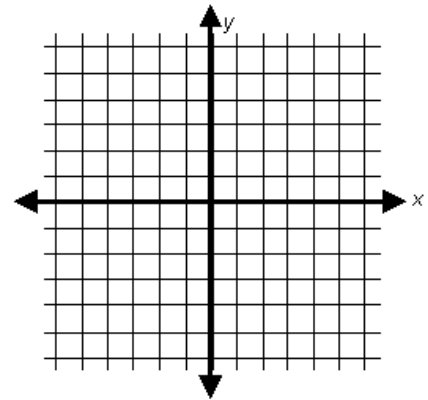
32. Evaluate  $\int_{-5}^4 f(x)dx$ , if  $f(x) = \begin{cases} -4 & , x \leq -3 \\ 2 & , -3 < x < 0 \\ 1 & , x \geq 0 \end{cases}$



33. Find  $f(x)$  if  $f'(x) = 6x^2 + 4x - 2$ ,  $f(-1) = 0$ .

34. Find  $\int_0^8 (2x^2 - 1)dx$  using Riemann Sums with  $n = 4$  by taking the sample points to be midpoints.

35. Find the total area that is between the curve  $y = \cos x$  and the x-axis on  $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ .



36.  $\int_1^5 f(x)dx = -1$ ,  $\int_3^5 f(x)dx = 3$  and  $\int_3^5 g(x)dx = 4$

Find: A)  $\int_3^5 [2f(x) + g(x)]dx$

B)  $\int_5^1 f(x)dx$

C)  $\int_1^3 f(x)dx$

## Integrals Review Solutions

1.  $8t^{1/2} + C$

2.  $\frac{u^4}{4} - u^2 + 7u + C$

3.  $-\frac{1}{2x^2} - 2x + C$

4.  $\frac{(x-8)^{24}}{24} + C$

5.  $-\frac{1}{16(4x^2+1)^2} + C$

### 6. Integration by Parts Only

7.  $\frac{2}{5}$

8. 48

9. 156

10.  $\frac{2\sqrt{10} - 4\sqrt{2}}{3}$

11. -19

12.  $\frac{5}{2}$

13.  $\frac{128}{3}$

14. 81

15. 168

16.  $f(x) = x^2 - \cos x - \frac{\pi}{2}x$

17.  $\frac{32}{3}$

18. 22

19. 13

20.  $9t^{2/3} + C$

21.  $-\frac{1}{2u^2} + \frac{2}{u} + 5u + C$

22.  $\frac{(1+\ln x)^2}{2} + C$

23.  $-\frac{1}{14(x-2)^{14}} + C$

24.  $-\frac{1}{4(3x^2+1)^4} + C$

25.  $\sqrt{y^2+1} + C$

26.  $\frac{1}{2}e - \frac{1}{2}$

27.  $\ln 1.5$

28.  $\frac{15}{4}$

29. 0

30. -14

31. 5

32. 2

33.  $f(x) = 2x^3 + 2x^2 - 2x - 2$

34. 328

35. 2

36. a) 10 b) 1 c) -4